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A D D R E S S  
TO THE  
ROYAL GEOGRAPHICAL SOCIETY  
OF LONDON;

*Delivered at the Anniversary Meeting on the 28th May, 1860,*

BY THE EARL DE GREY AND RIPON,  
PRESIDENT.

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OBITUARY.

IN accordance with our usual custom, I proceed to mention the losses by death which the Society has sustained since the last Anniversary.

Colonel George BAKER was one of the earliest associates of our Society, having been connected with it since the year 1830; and although, owing to the distance of his residence from London he was seldom enabled to share in our proceedings, there was a period in his earlier life when he distinguished himself by undertaking and carrying through, under many difficulties, a geographical work of no trifling importance at the time, and of which the value was highly appreciated, while it has never since been impugned.

As an officer of the 16th Light Dragoons, to which regiment he had been from his youth attached, he bore his part, under the Duke of Wellington, in the first operations of the Peninsular war; and although prevented from sharing in the triumphant conclusion of them by falling into the hands of the French during a cavalry skirmish after the battle of Salamanca, and being marched as a prisoner to Verdun, he joined his regiment again after the peace of 1814, was engaged at Waterloo, and accompanied the army afterwards to Paris.

Having subsequently devoted himself with much diligence to a cultivation of those branches of military study which were so efficiently encouraged and directed at that time by Sir Howard Douglas, in the College at Farnham, when it became necessary to define and map the boundary frontier between the empire of Turkey and the newly created kingdom of Greece, Colonel Baker was selected, in 1830, by the Earl of Aberdeen, who then held the seals of the Foreign Office, as the English Commissioner to whom the work was entrusted. Two other military officers were associated with him as the respective representatives of France and Russia, by whom, jointly with this country, the measure had been adopted; and a Greek and a Turkish officer were added afterwards to the Commission.

The obstacles which presented themselves to the first commencement of this operation, from the absence of any accurate geographical data on which it might with safety have been founded, and the obstructions afterwards interposed during the progress of it by the intrigues of the Turkish Government, requiring repeated remonstrances on the part of the Allied Commissioners, which were supported by our Minister at Constantinople—these were the difficulties that created a very serious delay before the work was finally completed. Nor was it until December, 1835, that the map was presented in its finished state to the Sultan.

It was based upon a trigonometrical survey of a narrow strip of country extending on each side of the boundary line, which, reaching from the Gulf of Arta at its western to that of Volo at its eastern extremity, included, with all its sinuosities, a distance of 137 miles; and it was defined by 95 landmarks, which, though mostly destroyed by the Turks in the winter of 1832, were restored in the following summer. The office devolved upon Colonel Baker of submitting to the Conference of the Allied Powers, during these protracted operations, a plan by which at length the objections raised by the Porte to the arrangement were overcome, and the measure was brought to a successful issue.

Colonel Baker maintained to the latest period of his valuable life, which closed at Bath in December, 1859, the same talent for military survey, and the same diligence in prosecuting it, which characterised him in his earlier career: for, having resided for a few weeks with his family during the last autumn at Torquay, he drew up an able report, accompanied with actual measurements, of the whole neighbouring coast, pointing out the weak and the strong points of

defence which it commands; and the report was transmitted to the Commissioners then recently appointed for inspecting the Defences of the Naval Arsenals and the Coasts of the country.

General Sir T. Makdougall BRISBANE, Bart., was the representative of a family of high antiquity and elevated position. After some preliminary education, partly at home and partly at the University of Edinburgh, young Brisbane was placed at an academy at Kensington, where he distinguished himself by his great proficiency, and showed the bent of his mind by attending the lectures of eminent professors, particularly on astronomy and mathematics. In 1789 an ensign's commission was procured for him, and in the following year he joined the 38th regiment, then stationed in Ireland, where he became acquainted with the Honourable Arthur Wellesley, who was then of similar rank; and the friendship thus commenced endured until the death of the Great Duke, more than sixty years after. In 1793 he proceeded to Flanders, and served through the campaigns of that and the following year, was wounded, and endured almost incredible hardships during the retreat of the British army. In a work entitled 'Reminiscences' (privately printed shortly before his death, and which contains many curious anecdotes of the Duke of Wellington), he says, "This was the severest winter I have ever seen in Europe. The troops were literally frozen to the ground every morning, and in one of those severe nights *eight hundred men were frozen to death*. . . . The Rhine was covered with a layer of ice 6 feet deep." In the October of the next year he was ordered to the West Indies, where he served with distinguished bravery under Sir R. Abercromby, Sir John Moore, Sir Thomas Picton, and other generals, at the capture of St. Lucia, Trinidad, and other islands. In 1799 his friends purchased a Lieutenant-Colonelcy for him in the 69th regiment, for the purpose of bringing him from the tropics, as his health had suffered greatly there. He accordingly came to England, but only to find that, contrary to expectation, the 69th had just sailed for Jamaica, which, after a few months at Cheltenham to recruit, he went out to join.

Colonel Brisbane, now for the first time in command, soon showed his aptitude for the situation. He endeavoured to improve the position of the army generally, by representing to the Commander in Chief the unhealthy position of the barracks throughout the West Indies, as being placed on the *leeward* instead of the *windward* side of the islands; but no notice was taken of his well-

meant endeavours, though his views have since received ample confirmation from the valuable 'Returns of Sickness and Mortality in the Colonies,' drawn up by Colonel Tulloch. Returning home, he was quartered in various parts of England until 1804, when the 69th was ordered to India; and as his health would not allow him to proceed thither, after trying in vain to exchange into the Guards or the cavalry, he was obliged to retire for a time on half-pay.

In 1810 Colonel Brisbane was appointed Adjutant-General at Canterbury, but he longed to join his old acquaintance, the Duke of Wellington, and, in consequence of his urgent applications, in 1812 he was made Brigadier-General, and proceeded to the Peninsula. There he was posted to the third division, commanded by his friend Sir Thomas Picton, and with it he served until the close of the war. Then he was sent to America, where he succeeded in causing the war on the Canadian frontier to be carried on according to the usages of civilized nations (which had not been the case before), and next served in France in the army of occupation. He had arrived in England just too late to share in the glories of Waterloo, but he was sent with twelve regiments to reinforce his old commander, who, when he inspected them at Paris, exclaimed, "*If I had had these men at Waterloo, I should have wanted no Prussians.*"

With the return of the army from France, in 1818, the services of Sir Thomas in the field came to a close. In 1819 he married Anna Maria, the heiress of Sir Henry Hay Makdougall, of Makers-toun, Roxburghshire, Bart., by whom he had two sons and two daughters, who all preceded him to the grave. In 1821, after holding for a short time the command of the troops in the south of Ireland, he was appointed Governor of New South Wales, where he found a wide field for the exercise of his active and benevolent mind. He introduced the culture of the vine; sugar-cane, cotton, tea, and tobacco; he imported horses, and thus so improved the breed that the colony can now supply cavalry horses for India; he did much to procure for it trial by jury and representative institutions, which it now enjoys. He encouraged, and liberally supported from his own means, all religious and charitable institutions; in his treatment of the convicts he abolished harassing and vexatious punishments, which he felt only irritated instead of reforming; and he first granted tickets-of-leave to the well-conducted, which gave a supply of much-needed labourers to the free colonists, the result of which was that at the close of his government, in 1826, the quantity of land under cultivation had been more than doubled,

while the expense of the convict establishment had been most materially reduced. On his quitting the government addresses of the most flattering nature were presented to him from all classes, and they were well deserved.

Sir Thomas now returned for the last time to his native land, and lived for more than thirty years as useful and as honoured as the man of science, and a public benefactor, as he had before been in his military and administrative capacity. He from his youth had cherished an ardent love for science, and a narrow escape from shipwreck had led him to become a practical astronomer. This was on his first voyage to the West Indies, when the ignorant master of the transport wandered out of his course on to the coast of Africa, and when he found his ship among the breakers, lost all heart and cried out, "Lord have mercy upon us, for we are all gone!" Young Brisbane, who was but two-and-twenty, replied, "That's all very well, but let us do everything we can to save the ship;" and, taking the command, he worked with his own hands until the vessel was placed in safety. This incident made a deep impression on him. "Reflecting," he says, "that I might often in the course of my life and services be exposed to similar errors, I determined to make myself acquainted with navigation and nautical astronomy; and for this purpose I got the best books and instruments, and in time became so well acquainted with these sciences, that when I was returning home I was enabled to work the ship's way; and having since crossed the tropics eleven times and circumnavigated the globe, I have found the greatest possible advantage from my knowledge of lunar observations and calculations of the longitude." This was shown in his voyage home from New South Wales, when he predicted the time of making Cape Frio, in Brazil, to within a few minutes, to the confusion of the captain, who, until day-break enabled him to see the land, believed himself at least 500 miles distant.

In order to pursue his astronomical studies, Colonel Brisbane, while he was on half-pay in 1808, had erected an observatory on a knoll, near the mansion house of Brisbane; and this in after years became his place of daily resort, beside often spending the night there. Whilst governor of New South Wales, he established an Observatory at Paramatta, which has rendered such services to science that it has been aptly styled "the Greenwich of the Southern Hemisphere;" and soon after his return to Scotland he formed another observatory at Makerstoun, to which he eventually

added a magnetic station, the only one in that country; and he showed great liberality alike in providing instruments, and in remunerating observers and printing the results of their labours. The clocks in the magnetic observatory cost upwards of 1200 guineas. He likewise assisted with his counsel and his purse many other establishments, as the Observatories of Edinburgh, Glasgow, and the Cape of Good Hope; and one of the latest acts of his life was to found two gold medals for the reward of scientific merit;—one for the Royal Society of Edinburgh, the other for the Society of Arts. The first of these was adjudged at Aberdeen, in September, 1859, to his fellow-countryman and former fellow-soldier, Sir Roderick I. Murchison. Such devotion to science did not pass unregarded. The Universities of Oxford and Cambridge conferred their degree of D.C.L.; while he was in New South Wales he was elected a Fellow of many learned Societies; and on the death of Sir Walter Scott he was chosen to succeed him as President of the Royal Society of Edinburgh. The gold medal of the Astronomical Society was awarded to him in 1828, and the address of the President (now Sir John Herschel) did but justice to him in saying that “the first brilliant trait of Australian history marks the era of his government, and that his name will be identified with the future glories of that colony, in ages yet to come, as the founder of her science.”

In 1836 he was created a Baronet; in 1837 named Knight Grand Cross of the Bath; in 1841 he became General, and at the period of his decease his was the third name on the Army List.

He died in the house in which he was born, on the 28th of January last, at the age of eighty-seven, and he is succeeded in the baronetcy by his nephew, the son of the late Admiral Brisbane.

Sir Thomas was a man of commanding appearance, more than six feet high, and with a handsome, intellectual expression of countenance. His name was on the Army List for a period of sixty-seven years, in the course of which he had fought in fourteen general actions, and twenty-three other battles, and had assisted in eight sieges. He had a gold cross and clasp for Vittoria, and the silver Peninsular medal and clasp; and received the thanks of Parliament in 1813 for distinguished service. He had crossed the tropics twelve times, the equinoctial line twice, had circumnavigated the globe, and had been in North and South America, Australia, the north of Europe, and the Mediterranean.

The best résumé that can be given of his character and pursuits

will be found in the following letter from our late President, Admiral W. H. Smyth :—

“ . . . . You wish to know my opinion as to the estimation in which I hold the merits of my admirable friend, General Sir Thomas M. Brisbane. My knowledge of the pursuits of this eminently distinguished officer is of many years' standing, and my personal acquaintance with him almost as long ; for, shortly after the peace of 1815, we met, British soldier and sailor—of all places in the world—in a French astronomical observatory ! And I can render testimony to the high regard paid by his late enemies to his scientific attainments.

“ From long intercourse I can have no hesitation in pronouncing that Sir Thomas was equally familiar with the theory and practice of astronomy ; and he not only worked himself, but was the cause of work in others. Nor should it be overlooked that intellectual zeal at that time was even more meritorious than of late, since it was necessarily exerted among the incessant and frequently distracting duties of actual warfare.

“ About the year 1820, when appointed to the high office of Governor of New South Wales, Sir Thomas resolved to improve our astronomical knowledge of the Southern Hemisphere. With this important object in view, previous to sailing for his destination, he made direct inquiries in various quarters as to how it could be executed to its fullest extent ; and I cannot but feel proud of having been consulted on that very interesting occasion.”

After detailing the establishment of the Paramatta Observatory, and its result—“ The Brisbane Catalogue of Southern Stars ”—the Admiral concludes :—

“ The well-known military career of Sir Thomas Brisbane is now matter of history ; but I may truly assert that there is not, either in the army or navy, an individual to whom ‘ *tam artibus quam armis* ’ can be more appropriately applied than to that excellent and honoured officer.”

Isambard Kingdom BRUNEL, Esq., one of the most eminent engineers of the day, was born at Portsmouth in 1806, while his father, the late Sir Mark I. Brunel, was engaged in erecting the Block-factory there. The principal works with which Mr. Brunel's name will in future ages be associated, are the Thames Tunnel, in conjunction with his father ; the *Great Western*, and the *Great Eastern* Steam Ships, both, at their respective periods, the largest vessels ever built ; docks at various seaports ; the Great Western Railway, with



its various branches and continuations; the Hungerford Suspension Bridge; the Tuscan portion of the Sardinian Railway; and the Hospitals on the Dardanelles, erected during the late war with Russia.

The President of the Institute of Civil Engineers in his address remarks: "In his professional career, it appears to me that full justice has not been done to the memory of Mr. Brunel. I allude more especially to his exertions in accelerating the progress of Oceanic Steam Navigation. The *Great Western* was a brilliant example of the correctness of his conceptions in this point. It must be conceded, that he was the first clearly and practically to conceive the advantages to be derived from augmenting the size of steamers, with a view to increased speed and to the extension of their voyages. Looking back, therefore, to the period of the construction of the *Great Western* steamer, she must be admitted to have been an absolutely successful experiment, mechanically and commercially; and the names of Brunel as the engineer, of Paterson as the shipwright, and of Maudslay and Field as the constructors of the engines, can never be omitted from the records of Oceanic Steam Navigation. The next step was the *Great Britain*; and so far as regards the construction of the hull, the efficiency of that vessel, even to the present day, bears ample testimony to the skill of the design; whilst her having endured a whole winter's buffeting of the waves in Dundrum Bay, testifies to the strength of her construction, and to the powers of resistance of which iron vessels are susceptible. It must not be forgotten, that it was to this vessel that the screw-propeller was first applied; and it should be stated, that by Mr. Brunel's exertions in experimenting upon the *Archimedes*, the introduction of that mode of propulsion was greatly accelerated." He was very early distinguished for his powers of mental calculation, and not less so for his rapidity and accuracy as a draughtsman. His power in this respect was not confined to professional or mechanical drawings only. He displayed an artist-like feeling for and love of art, which in later days never deserted him. He was elected a Fellow of this Society in 1852, and showed his interest in it by a frequent attendance at our evening meetings.

In the death of the Hon. Mountstuart ELPHINSTONE the Society has lost one of its earliest and most distinguished Fellows. He was born in 1779, and repaired at an early age to India, in the civil employment of the East India Company; and gradually

rose to all the principal offices of the diplomatic service at a time when our conquests were at their highest progress under the brilliant administration of the Marquess Wellesley. His friend and fellow labourer, Sir John Malcolm, said of him at the close of his public career, some thirty years subsequently, on the night of a great gathering at Bombay to bid Mr. Elphinstone "God speed" back to his native land, that from the day he, Sir John, met him a stripling on the beach to that hour (and the interval comprised years most eventful in the history of British India), Mr. Elphinstone had performed a distinguished part in every great political event that had occurred. In 1801 he was appointed an Attaché to the Residency at Poonah, and on General Wellesley's visiting that court he asked the Resident "to give him young Elphinstone." This was declined at the time, but in consequence of illness compelling Sir John Malcolm to resign the office of interpreter in 1803, Elphinstone joined the staff of the Duke of Wellington, and fought by his side in the most remarkable of those Indian battles that taught him how to conquer Spain. In 1806, the then Governor-General, the Earl of Minto, selected Mr. Elphinstone for the important and difficult mission to Cabul, a country at that time almost unknown to us; and of that mission he published, six years after, an able and instructive narrative.\* The travels of our medallist Sir Alexander Burnes, and our national disasters in that country, having afterwards drawn the attention of the British public to those regions, a third edition of the work was called for thirty years after it was first published, acquiring for its author considerable literary reputation.

In 1810 Mr. Elphinstone returned to Poonah as Political Resident, and "there," says a recent writer, "for eight years he conducted the British relations with the faithless, subtle, intriguing ruler of the Mahrattas in a manner which, for able statesmanship, has never been surpassed." The principal part of the Peishwah's dominions having been annexed in 1819, he was eventually raised to the government of Bombay, where for seven years he discharged its duties with the utmost talent and skill. In this position the liberal and enlightened Bishop Heber saw him, and described him as "in every respect an extraordinary man, possessing great activity of body and mind, remarkable talent for and application to public business, a love of literature, and a degree of almost

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\* Account of the Kingdom of Cabul.

universal information, such as I have met with in no other man similarly situated; and manners and conversation of the most amiable and interesting character."

A statue by Chantrey, a portrait by Lawrence, a service of plate, and, above all, the establishment of an "Elphinstone College" and two "Elphinstone Professorships," are the enduring monuments of Mr. Elphinstone's government of Western India. On his return home, shattered in health and exhausted by official labours, he betook himself with ardour to the study of the classics of ancient and modern Europe, to be added to the store of his already ripe Oriental knowledge. In these studies, and in the preparation of his 'History of India,' he passed the first fourteen years of his home residence. The research necessary for the History of the Mogul rule in Hindustan was enormous; and the style in which that elaborate work is written marks the accomplished scholar.

The last eighteen years of Mr. Elphinstone's life were spent in literary retirement. On the 20th of November, and in the 81st year of his age, the useful, blameless, and happy life of this eminent man was brought to a close by a stroke of apoplexy.

By the decease of William Richard HAMILTON, England has lost one of her best public servants, and a stedfast promoter of letters, art, and science; while this Society recognises in him one of its earliest adherents, long one of the Council, and who, after filling the offices of President and Vice-President, only retired from our Trusteeship a year before his death.

Born in 1777, Mr. Hamilton was educated at Harrow School and at the University of Cambridge, where he acquired that thorough classical knowledge which enabled him soon afterwards to prove of signal service to his country.

He began life in the diplomatic service as the attaché and private secretary of the late Lord Elgin, with whom he proceeded on an embassy to Constantinople in the year 1799. In 1801, being sent to Egypt (then rescued from French occupation by the British arms), Mr. Hamilton, in company with Colonel Hilgrove Turner, so ably negotiated the terms of peace as to procure the cession of many of those noble works of Egyptian art which now adorn the British Museum. Among these was the famous Trilingual Stone of Rosetta, which, from its comparatively small size, had been hid away in a French transport, from which Mr. Hamilton rescued it at the risk of his life, as the vessel was infected with the plague. In the subsequent year Lord

Elgin having obtained from the Porte the gift of the famous marbles of the Parthenon, Mr. Hamilton was conveying them to England when the ship was wrecked at Cerigo, and those treasures were submerged. But, thanks to the perseverance and zeal of our deceased Associate, these productions of the very finest period of Greek Art were extricated from the deep, and have long constituted the chief ornaments of our great National Museum.

Following up his leading bent, Mr. Hamilton became a Fellow of the Society of Antiquaries in 1804, and distinguished himself by various publications in the Transactions of that body, among which his memoir 'Remarks on the Ancient Fortresses of Greece' was the precursor of that valuable and more extensive publication which he issued in 1810, under the title of 'Ægyptiacæ.'

His public career was in the mean time essentially bound up with the business of the Foreign Office. Acting as secretary of Lord Harrowby and précis writer to Lord Mulgrave, he became Under-Secretary of Foreign Affairs in 1809. In the stormy and eventful period of the next six years, including the Peninsular War, and the battle of Waterloo, Mr. Hamilton held the same important office, which he occupied even to the year 1822, when he was appointed Minister at Naples. At the peace of Paris, in 1815, when he accompanied Lord Castlereagh to the Continent, we find Mr. Hamilton again standing forward in his love of the Fine Arts, and serving as an agent of the British Government in procuring the restitution to Italy of those famous paintings and sculptures of which she had been deprived by the French conquests.

In the fine arts then, as in antiquarian research, Italy as well as our own country has been deeply indebted to two William Hamiltons—the one the celebrated contemporary of Nelson, the other our deceased Member, and both of them British Ministers at Naples. The last official appointment indeed held by Mr. Hamilton was that of Minister Plenipotentiary and Envoy Extraordinary to the King of Naples, in which position he truly enjoyed life, by studying the relics of classical art, and in cultivating the acquaintance of all the eminent Italians, including Canova.

Returning to England in 1825, and retiring from public life on his well-earned pension, Mr. Hamilton then gave himself up to the pursuits of literature and science, in promoting which he proved so eminently useful. As early indeed as 1813 he had become a Fellow of the Royal Society; and in 1830, when this Society was founded, he took an active part in its formation, and also acted

for many years as the Treasurer of the Royal Institution of Great Britain.

Those only who were intimately acquainted with Mr. Hamilton could form an adequate idea of his valuable intrinsic qualities. Void of all display, his knowledge on a vast variety of subjects was profound and accurate; and while he could control and manage details of every-day business, he found time for much literary, antiquarian, and geographical research. He was also during twenty years one of the most efficient and useful trustees of the British Museum, as all his associates have testified. In that great National Repository of art and natural science, he who had brought to it so many of the finest works of Egyptian and Greek sculpture might well look around him with a proud and pleasing retrospect. But although he had deservedly acquired the name of Grecian Hamilton, his preference for the finest productions of art never led him to form a too exclusive estimate of the value of his favourite researches. Though not a naturalist, he had the highest respect for those who cultivated natural history; and so equitable and fair was he in his judgments, that those trustees who represented that portion of the British Museum have uniformly rejoiced that Mr. Hamilton was associated with them; for in him they felt secure that they could depend upon a man whose votes were always regulated by the desire to promote not one only, but all the departments of our great National Repository.

Having adverted to the career of Mr. Hamilton as a public servant, and as a cultivator of letters and the fine arts, let us here specially record our thanks to him for his well-performed duties as a geographer. At the head of those duties we are bound gratefully to remember that in 1838, the first year of his Presidency, he set the example of reading from the chair an Anniversary Address, which practice, followed up by him in the succeeding year, and never since departed from, has been one of the efficient means of raising our Society to its present enviable position. We may well therefore revert to that which may be called our inaugural discourse; for although we had then been a Society for seven years, and had enjoyed the advantage of receiving Annual Reports from our able Secretaries, we still lacked that enlarged view of our general objects which was first eloquently put before us by Mr. Hamilton. After developing all the links which bind Geography to History and Statistics, as well as to the sciences of Astronomy, Geometry, Natural History, and Geology, and showing that such researches

are comparatively easy in civilized countries, Mr. Hamilton thus proceeds: "But the real geographer becomes at once an ardent traveller, indifferent whether he plunges into the burning heats of tropical deserts, plains, or swamps, launches his boat on the unknown stream, or endures the hardship of an Arctic climate, amidst perpetual snows or ice, or scales the almost inaccessible heights of the Chimborazo or the Himálaya. Buoyed up in his greatest difficulties by the consciousness that he is labouring for the good of his fellow-creatures, he feels delight in the reflection that he is upon ground untrodden by man, that every step he makes will serve to enlarge the sphere of human knowledge, and that he is laying up for himself a store of gratitude and fame." \*

These stirring words were followed up by such clear and precise analyses of all the prominent geographical researches of the year as to fix a high standard for the discourses of all future Presidents. When indeed those researches had reference to Archæology and Numismatics, or to any point of ancient history, then it was above all that Mr. Hamilton shone out as the most powerful comparative geographer, and then it was that we felt the true value of the application of his learning.

Let it also be said that our deceased member was equally fervid in his appreciation of geography in its newest phases. Whilst the "world known to Homer" and the ancients had charms for him which he thoroughly enjoyed, his capacious mind revelled in that spirit of modern discovery which he characterised as "the happy spell which changed the destiny of nations, and without which we should long have remained immersed in the darkness in which our ancestors groped their way in the pursuit of knowledge, and should have lived on upon the ill-digested remnants which the ancients had left us."

Although he preserved a clear and unruffled mind to the last, Mr. Hamilton retired a year before his decease (then in his eighty-second year) from the active duties of life, resigning in succession his offices as trustee of the British Museum and of our Body; it having been a dominant feature in his character never to take part in any occupation to which he could not thoroughly devote all his powers. One body only,—that club of lovers of the fine arts called the "Dilettanti,"—he continued to manage with efficiency to within a week of his decease.

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\* Journal of the Geographical Society, Vol. VIII. President's Address, p. xxxix.

If the varied merits of our former President have thus been glanced at, as they were exhibited in public through a long, active, and well-spent life, those who were admitted to his personal friendship learnt to admire in Mr. Hamilton many sterling social qualities, for no one of which was he more remarkable than in the admirable instruction which he gave to his children, who, including one of our Presidents, and other sons distinguished in the civil, military, and naval service of their country, together with an only accomplished daughter, are left to mourn his loss.

The late Lieutenant-Colonel William Martin LEAKE was born in London on the 14th January, 1777. He was the son of John Martin Leake, a commissioner for auditing the public accounts, and grandson of Stephen Martin Leake, Garter Principal King-at-Arms; the family name of Leake having been derived from Sir John Leake, the famous Admiral of Queen Anne's reign.

After preliminary instruction at the Royal Academy of Woolwich he obtained his commission in the Artillery in the year 1794, and commenced his professional career in the West Indies. In 1799 he entered the field of his subsequent labours on being appointed to a mission for the instruction of the Turks in the use and practice of artillery, and repaired to Constantinople for that purpose. Early in 1800 he quitted that capital for more active service, and it having been deemed advisable by the English Ambassador that the Grand Vizier, then engaged in the defence of the southern provinces of the Turkish empire against the French, should have the assistance and advice of competent English officers, General Koehler, Captain Leake, and others, were despatched to Jaffa. They traversed Asia Minor, and visited the island of Cyprus; but meeting there Sir Sidney Smith, who had just signed a treaty for the evacuation of Egypt by the French, their attendance on the Vizier was no longer considered essential, and they returned to Constantinople. That treaty not having been confirmed, Captain Leake again proceeded on his way, and ultimately joined the army of the Grand Vizier in Syria, where, in the winter of the same year, he took advantage of his position to visit the greater part of ancient Palestine and Judæa.

In 1801 he crossed the Desert, and entered Egypt with the Turkish army; and Alexandria having been surrendered, and the French withdrawn, he received the directions of Lord Hutchinson to accompany the late Mr. William Richard Hamilton (then private secretary to Lord Elgin) into Upper Egypt, for the purpose of

making a general survey of that country, as well in regard to its military and geographical, as to its political and commercial state. The results of these labours were a map of the course of the Nile, from the Cataracts to the sea, a determination of most of the ancient sites, a description of all the monuments of antiquity contained in that space, together with a large collection of observations on the agricultural and commercial state of the country: an account of this journey was published by Mr. Hamilton in 1809.

In 1802 Captain Leake revisited Syria, and continued there the researches on which he had been employed in Egypt; and on his return home, having embarked on board the vessel in which Mr. Hamilton was conveying the Elgin Marbles to England, he was wrecked off the Island of Cerigo, and narrowly escaped with his life.

The acquaintance with Oriental politics and habits, which he had acquired during this service, was doubtless the cause of his subsequent selection for an important mission to the European provinces of Turkey. He received orders from His Majesty's Government to undertake a survey of the coasts and interior of that country, to examine its fortresses and means of defence, to point out their deficiencies to the native Governors and Chiefs, and advise for their improvement; and on that service he repaired in the year 1804.

From 1804 to the winter of 1806 he travelled considerably, in pursuance of his instructions, in Northern Greece and the Morea, and while he performed the important duties of his mission in a manner that gave entire satisfaction to the Home authorities, his peculiar tastes and talents for research received full development in a country where every day's journey produced an historical or topographical problem, which it taxed his erudition and critical acumen to solve; and where his thorough knowledge of ancient Greek enabled him to decipher obscure inscriptions, which led to the identification of many a ruined site.

The occurrence of hostilities, at the end of 1806, between England and the Porte prevented him from prosecuting his travels. He was detained as a prisoner at Salonica, whence, however, he escaped; and finding his way to Malta, he proceeded to England for the restoration of his health. Subsequently, he was again employed by His Majesty's Government in Greece till 1809; and it was on the observations made with so much keenness and perseverance during these years, from 1804 to 1809, extended by



subsequent reflection and study, that were formed those valuable and standard topographical works that appeared so many years later, which, by their well-weighed arguments and accurate observations, have justly caused their author to be termed a "*model geographer*," and from this period also may be dated that partiality for the modern Greek people, that indulgence for their weakness, and that hope for their future, which afterwards inspired many of his lesser writings, and coloured his conversation.

In 1814 Lieutenant-Colonel Leake was, as an English officer, appointed to attend upon the army of the Swiss Confederation, under the command of the Archduke John, and was for months at Berne, in that capacity, at the conclusion of the great European war.

On his return to England his literary labours commenced, and were continued with little intermission, and but little farther interruption from his more purely professional duties (for he retired from the army in the year 1823), until the day of his death.

In the year 1814 were published his 'Researches in Greece,' in 1821 his first edition of the 'Topography of Athens,' and in 1822 his edition of 'Burckhardt's Travels in Nubia, Syria, and Arabia.' In 1824 he narrated the observations he made in Asia Minor 24 years previously. In 1826 issued the 'Historical Outline of the Greek Revolution,' and in 1829 the 'Demi of Attica.' In 1830 he published one of his greatest and most learned works, accompanied by a valuable map, his 'Travels in the Morea,' which, in 1835, were succeeded by his 'Travels in Northern Greece,' a work of equal research and more extensive proportions, with an accurate map on a considerable scale also; and, in 1841, appeared the 2nd edition of the 'Topography of Athens.'

The latter years of his life were occupied in the production of the 'Numismata Hellenica,' a most considerable and important work, containing an exact and faithful description of every coin in his extensive collection, enriched by critical and historical notes. This was published in 1854; and in 1859, but a few weeks before his death, a supplement on the same plan as the original work issued from the press, forming with that a mine of information for the collector, the antiquary, and the historical student, who in turn might find, as Colonel Leake himself had found, that the design on a coin could throw strong light upon many a question of ancient history or topography otherwise obscure or disputed.

Colonel Leake was a fellow of several learned Societies, both

English and foreign. He was admitted a member of the Society of Dilettanti in 1814; and on the death of Lord Northwick and Mr. Hamilton, in 1859, became second on the list, Lord Aberdeen only being above him. In 1828 he was elected a member of *the Club*, and at the time of his death was senior member of the Royal Society Club, except one. He was a fellow of the Royal and the Royal Geographical Societies, and an honorary member of the Asiatic, a vice-president of the Royal Society of Literature, an honorary member of the Royal Academy of Sciences at Berlin, and a correspondent of the Royal Institute of France.

In 1838 Colonel Leake married Elizabeth Wray, eldest daughter of the late Sir Charles Wilkins, and widow of William Marsden, both of whose names are honourably known to the Oriental literary world.

On the 6th January, 1860, Colonel Leake passed from us after a short and sudden illness; his intellect never weakened, his energies scarcely relaxed, notwithstanding the weight of 83 years. A very striking feature of his character was his modest and retiring nature; endearing him to all who knew him intimately, but disguising from others, less familiar with him, many of those eminent qualities of intellect and high scholarship which he possessed.

Colonel Leake was buried at the Kensal Green Cemetery. The Greek minister, at his own desire, followed him to the grave, expressing thereby the gratitude of his country to one who had spared no effort on behalf of the Greek nationality, and had done so much by his works towards elucidating the remarkable features of the land of Greece and the scenes of her glorious history. In him we have lost not only a scholar and an antiquary, but one other link (when so few survived) that connected us to the politics, the literature, and the society of the foregone generation.

LORD LONDESBOROUGH, the second surviving son of Henry, first Marquis Conyngham, by his marriage with Elizabeth, daughter of Mr. Joseph Denison, was born on the 21st of October, 1805. He was twice married: first, July 6, 1833, to the Honourable Henrietta Maria Forester, fourth daughter of the late Lord Forester, who died in April, 1841; and secondly, in 1847, to Miss Bridgeman, eldest daughter of Captain the Honourable Charles Orlando Bridgeman, which lady survives her husband. His Lordship leaves issue by both marriages. As Lord Albert Conyngham he served for a short period in the Royal Horse Guards, but then adopted the

diplomatic service. In May, 1824, he was appointed attaché to the British Legation at Berlin, and in the following year removed to Vienna, where he remained until February, 1828, when he was made Secretary of Legation at Florence. In July, 1829, he proceeded to Berlin in the same capacity, and continued in that employment till June, 1831. He sat in the House of Commons for some years previous to his elevation to the House of Lords, having represented Canterbury from 1835 to 1841; and again from March, 1847, to the early part of 1850, when he was raised to the peerage by the title of Baron Londesborough. In 1849 he assumed the name of "Denison," in lieu of that of Conyngham, in accordance with the will of his maternal uncle, Mr. William Joseph Denison, who bequeathed to him the bulk of his immense wealth. In politics Lord Londesborough was usually a supporter of Whig principles. He was created by George IV., in 1829, a Knight Commander of the Hanoverian Order, and was a Deputy-Lieutenant of the West Riding of York.

Lord Londesborough's taste for literature, science, and the fine arts, brought him into connexion with this and most of the learned Societies, and with their leading men. He availed himself of every opportunity to co-operate with and to give them encouragement and substantial support. No one was perhaps more identified with the progress of the study of our national antiquities. During his residence at Bourne Park, near Canterbury, he was enabled to make many successful researches in a branch of archæology heretofore but imperfectly understood, and his and Mr. Akerman's communications to the 'Archæologia,' on the contents of the Saxon tumuli upon Breach Downs and in the neighbourhood, recorded a series of facts which have been often referred to, and which were rapidly augmented by fresh discoveries, made either at his Lordship's instigation, or in consequence of his example. In later times his Lordship instituted similar researches in Yorkshire with equal success.

When the British Archæological Association was formed, he (then Lord Albert Conyngham) accepted the office of President; and by his personal exertions and influence mainly contributed to the triumph of the new institution at its first congress at Canterbury.

The general collection of works of early and mediæval art at Grimston may be estimated by his 'Miscellanea Graphica,' a

splendid work in folio, edited by Mr. Thomas Wright, and illustrated by Mr. Fairholt.

Towards the close of 1848 his Lordship visited Greece and Italy, and in the following year printed his tour, under the title of 'Wanderings in Search of Health:' a volume containing much information and well-told personal adventures.

Baron Peter MELVILL VAN CARNBEE was born 20th May, 1816. He received his naval education at the late Royal Naval Institution at Medemblik. In 1835, when a midshipman, he made a voyage to the East Indies, and having returned to the Netherlands in 1838, was promoted to Second Lieutenant, and proceeded once more to the East Indies, where he remained until 1845, being engaged in the Surveying Office of East Indian Hydrography. He then came back from the East Indies to Holland in charge of the Overland Mail. In the year 1850 he sailed again for the East Indies, and was promoted to First Lieutenant, and elected Secretary of the East Indian Hydrographical Office. In October, 1856, he was promoted to Captain-Lieutenant, and died at Batavia in the fortieth year of his age.

Baron Melvill took little active part in surveying, but devoted himself to the study and compilation of the surveys of former and recent naval officers, and constructed from them charts and sailing directions. In this work his industry and intelligence were soon manifested, and the following are some of the more important works published by him:—

'Seaman's Guide Round Java,' which has been translated into the English language, and 'Le Moniteur des Indes,' by Melvill and Siebold, in 4 vols. The charts compiled by him are—'Passages between Sumatra and Borneo, with Riour, Singapore,' &c., 'The North Part of the said Chart with Anambas and Natuna Islands,' 'Chart of the Island of Java, and Passages Round Java,' in 5 sheets, 'Charts of the Strait of Macassar and of the Islands east of Java,' by Melvill and Smit. In addition to these he has constructed and published many small maps, the principal of which are, 'Carte Générale des Possessions Néerlandaises aux Indes Orientales, 1846,' 'Carte de l'Île de Celebes, 1848,' 'Carte de l'Île de Java, 1847,' 'Carte de l'Île de Sumatra, 1848.' The latest work on which he was engaged, was the 'Algemeene Atlas van Neerland's Oost Indie.' His life was not spared to allow of his publishing more than 12 sheets, and the completion of this atlas will have to be effected by others.

He was a member of many Societies, and regret for the loss of this distinguished and amiable man is not confined to his personal friends, but is shared by naval men and Geographers, who must feel greatly indebted to him for the light he has thrown on the Hydrography of the East Indian Archipelago.

Captain William MOORSOM, R.N., C.B., entered the Royal Navy in 1830, passed his examination in 1835, and at the period of his promotion to the rank of Lieutenant in 1842, had been serving for some time in the East Indies as mate on board the *Endymion*. From that period up to his death he served with distinction in different stations, received post rank in 1851, and afterwards the Companionship of the Bath, as well as several foreign distinctions. He became a Fellow of this Society in 1853, and died in the early part of the present year.

The Venerable William Forbes RAYMOND, Archdeacon of Durham.—At Lincoln's Inn Mr. Raymond was appointed Warburtonian Lecturer, and also filled the post of Assistant-Precacher to Bishop Heber and to Bishop Maltby. He availed himself of this opportunity of applying, with great success, his learning and his skill in the Oriental languages to the illustration of Scripture. When Bishop Maltby resigned the position in 1835, he expressed his deep sense of the faithfulness and ability shown by Mr. Raymond in the office of his assistant.

The friendship and assistance of Mr. Raymond were of the greatest value and comfort to Bishop Maltby during the remainder of his Lordship's life, especially during his episcopal career in the dioceses of Chichester and Durham. As Examining Chaplain he gained the affection of the candidates for holy orders by his urbanity, and his kind and judicious advice. Whenever he found any who were anxious to pursue their theological studies in the midst of their parochial ministrations, he not only gave them the most friendly encouragement, but furnished them with such directions as might enable them to employ learning to real practical purposes. Sacred geography was one of his favourite subjects, and he pointed out to the young clergyman how deeply interesting such a subject might be rendered for expositions in the church, as well as for study in private.

After repeatedly refusing valuable preferment which Bishop Maltby offered him, he at last, in 1846, accepted the Archdeaconry of Northumberland, endowed with one of the reduced canonries in Durham Cathedral. To the great regret of the clergy he resigned the Archdeaconry in 1853. Indeed they were justly grieved at being deprived of the services of one who had gained their confidence and esteem by his sound judgment and ready attention in his official intercourse with them, as well as by his

gentleness of manner, and sympathy with them in their ministerial trials.

Archdeacon Raymond became a Fellow of this Society in 1852, and was a frequent attendant at our evening meetings.

Professor Karl RITTER was born at Quedlinburg in 1779, and at the age of five years was received gratuitously into Salzmann's educational establishment at Schnepfenthal, where he remained eleven years; whence he was removed to the University of Halle, and, remaining there for two years, then went to Frankfort. Here he met with men eminent in science, among whom were Humboldt, Buch, and Sömmering the physician. Ritter's first literary essays were published in the 'Kinderfreund,' from 1803 to 1806. In the latter year he published six maps of Europe, and in 1811 a 'Geography of Europe,' in 2 volumes.

In 1814 Ritter proceeded to the University of Göttingen, where he prepared the plan for his great work on Comparative Geography, a work which will long remain a record of the perseverance of the author. The first volume of this work was brought out in 1817, and the second volume, concluding Asia, in 1820. The year previously Ritter had been appointed Professor of History at the Frankfort Gymnasium, but soon after proceeded to Berlin, where he was made Professor of Geography at the Military Academy and the University. At first his lectures were sparingly attended. The Professor's fame, however, soon spread, and the largest lecture-hall could barely accommodate the numbers desirous of hearing them. The lectures most crowded were those on General Geography, on Palestine, on Greece, and on Italy. His professional duties left Ritter but little leisure to bestow upon the second edition of his 'Geography;' nevertheless, from 1822, the date of the appearance of the first volume, to within a short time of his death, he carried the work to the 19th volume of Asia. I perfectly agree with the learned Mr. Norris, that "the labours of Karl Ritter are characterized by great industry, and an anxious desire to gather up, and systematically to arrange, every fact relating to the regions treated of in his work, and to leave no source unexplored from which any information was to be derived. His great work comprises not only the geography of each country strictly considered, but also the history, antiquities, politics, ethnology, natural history, and an account of any travels through them which may tend to throw light upon their condition." During his

last visit to England, he was a frequent attendant at the rooms of this Society. Ritter was one of the founders of the Geographical Society of Berlin, and an Honorary Member and Medallist of this Society, to which he also contributed his works. Dr. Kiepert has been elected to the Professorship vacant by the death of the lamented Karl Ritter.

Dr. John SIMPSON, M.D., R.N. — Dr. Simpson accompanied Captain Moore in the *Plover* to Behring Strait in search of Sir John Franklin and his companions in 1848, and after passing three winters in that locality, returned with Captain Moore and the other officers, viâ San Francisco, to England. He immediately volunteered to go back, by the same route, with Captain Maguire, who was appointed to succeed to the command of the *Plover*. He again passed three winters in the ice, two of which were at Point Barrow. He was greatly beloved by every one on board, and was so successful in his treatment of the crew that not a single life was lost. He made himself acquainted with the Esquimaux language, and wrote the best—indeed it may be said the only—account of the Western Esquimaux, and which will be found at page 917 in the Arctic Blue Books for 1855, and in the pages of the ‘Nautical Magazine,’ and will ever be considered a most valuable acquisition to our ethnographical knowledge of that part of the globe. On his arrival in England he was ordered to Malta Hospital, and rendered good service there during the Crimean war. He was afterwards promoted to Haslar Hospital, where his brief, but most useful and honourable career in the service terminated. Dr. Simpson was elected a Fellow in 1855, and took a warm interest in the Society. He was a highly talented man, well versed in his profession, utterly regardless of self, and devoted the best energies of his mind in advancing the happiness of others; in a word, he was a true Christian, well deserving of imitation in his singleness of purpose.

Robert STEPHENSON, one of our most eminent engineers, and M.P. for Whitby, was born at Wellington in 1803, under very humble circumstances. On leaving school, at the age of fifteen, Robert Stephenson was apprenticed to Mr. Nicholas Wood at Killingworth, to learn the business of the colliery, where he served for three years, and became familiar with all the departments of underground-work. He was afterwards sent, in the year 1820, to the Edinburgh University, where Hope was lecturing on Chemistry, Sir John Leslie on Natural Philosophy, and Jameson on Natural

History. Stephenson remained in the University six months only, but is said to have acquired in that brief period as much knowledge as is usually done in a three years' course. It cost his father 80*l.*, but the money was not grudged when the son returned, bringing with him the prize for mathematics, gained at the University.

In 1822 Robert Stephenson was apprenticed to his father; but his health giving way after a couple of years' exertion he accepted a commission to examine the gold and silver mines of South America. The change of air and scene contributed to the restoration of his health; and after having founded the Silver Mining Company of Columbia he returned to England to assist his father in the arrangements of the Liverpool and Manchester Railway, by placing himself at the head of the factory at Newcastle. He obtained the prize of 500*l.* offered by the directors of that company for the best locomotive engine; and, about the same period, designed for the United States an engine specially adapted to the curves of American railways; and to him we are indebted for the type of the locomotives used in both hemispheres. The next great work upon which Stephenson was engaged was the survey and construction of the London and Birmingham Railway, which he undertook in 1833. He had already been employed in the execution of a branch from the Liverpool and Manchester Railway, and in the construction of the Leicester and Swannington line, so that he brought to his new undertaking considerable experience. His evidence before Parliamentary committees was grasped at, and it may be said that, in conjunction with his father, he has directed the execution of more than a third of the lines in the country. They were both consulted as to the Belgian system of railways, and obtained the Cross of the Legion of Honour in 1844. For similar services performed in Norway, which he visited in 1846, Robert Stephenson received the Grand Cross of St. Olaf. So also he assisted either in actually making or in laying out the systems of lines in Switzerland, in Germany, in Denmark, in Tuscany, in Canada, in Egypt, and in India. As the champion of locomotive in opposition to stationary engines, he resisted to the uttermost the atmospheric railway system, which had at one time considerable repute. The bridges he erected include that at Newcastle, constructed of wood and iron; the Victoria Bridge at Berwick, built of stone and brick; the bridge in wrought and cast iron across the Nile; the Conway and the Britannia Bridges over the Menai



Straits; and the Victoria Bridge over the St. Lawrence. Speaking of Stephenson in his address to the Institute of Civil Engineers the President remarks: "One of the distinguishing characteristics of his professional career was, that however bold he was in the conception of an idea, as for instance the Britannia Tubular Bridge, yet no one with whom I ever came in contact, watched with more anxiety the completion of these enterprises than did Mr. Stephenson. His mind was ever occupied in anticipating how, and in what shape, failures might arise. Another distinguishing feature in our late friend's career was his treatment of all those who were associated with him in his undertakings; his habit, with those who enjoyed his confidence, was to leave with them the utmost amount of responsibility which he could possibly lay upon them, and never to interfere, except in cases of emergency, or where his moral influence was required to prevent undue interference from superior authorities. The consequence has been, that over the whole face of the globe there are men of his school who have risen to competency and to eminence, and who live to extol and respect the memory of their revered chief."

He took great interest in all scientific investigations, particularly in the pursuits of this Society, being himself a great traveller and a valued Member of the Council at the period of his death. As a specimen of his liberality in the cause of science, it may be mentioned that he placed his yacht, the *Titania*, at the disposal of Professor Piazzzi Smyth (the son of our former excellent President, Admiral W. H. Smyth), who was sent out with very limited means to Teneriffe, to make sundry scientific observations, and thus materially assisted the researches of that gentleman. In the same spirit he came forward in 1855, and paid off a debt amounting to 3,100*l.*, which the Newcastle Literary and Philosophical Society had incurred, his motive being, to use his own phrase, gratitude for the benefits which he himself had received from it in early life, and a hope that other young men might find it equally useful.

At the Leeds Meeting of the British Association of Science, he proposed a yacht trip to Iceland, to be accompanied by Dr. Shaw and others; but his health had been delicate for about two years, and he complained of failing strength just before his last journey to Norway. If his loss be severely felt in his profession, it is still more poignantly so in his large circle of friends and acquaintances. His benevolence was unbounded. His own pupils are

said to have regarded him with a sort of worship, and the number of men belonging to the Stephenson school who have taken high rank in their peculiar walk shows how successful he was in his system of training, and how strong was the force of his example. The feelings of his friends and associates were not less warm. He has passed away, if not very full of years, yet very full of honours.

Sir George Thomas STAUNTON, Bart., D.C.L., was the only child of the late Sir George Leonard Staunton, who is well known to the public as having accompanied Lord Macartney as Secretary of the first embassy to China, in the year 1792, and as the author of the account of the Embassy which was published afterwards. He is not less well known to those who are acquainted with the history of British India as having, when Lord Macartney was Governor of Madras, concluded the peace with Tippoo Sultan in the year 1782.

Sir George was born in May 1781, and died, after a succession of paralytic seizures, in the summer of the last year. He succeeded his father in the baronetcy in the year 1801. After his father's death he was the last male representative of a very ancient English family, the branch of it from which he was descended having been established as landed proprietors in the county of Galway since the middle of the 17th century.

In the year 1792 he accompanied his father to China, under the nominal designation of page to the Ambassador. For some time before the embassy embarked, and during the voyage to China, he had the opportunity of studying the Chinese language under two native Chinese missionaries from the Propaganda College at Naples; and he soon made such proficiency in acquiring a knowledge of it, as to be able to speak it with tolerable fluency, and to copy papers written in the Chinese character. In this manner he became a very useful appendage to the embassy. When the embassy was presented at the Chinese Court, the Emperor inquired for the little boy who could speak Chinese, conversed with him for some time, and good-naturedly presented him with an embroidered yellow silk purse for holding areka-nuts from his own girdle.

On leaving China, Sir George L. Staunton engaged a Chinese servant to accompany him to England, in order that his son, by constantly communicating with him in Chinese, might keep up and extend his knowledge of the language.

In the year 1799, having received the appointment of Writer in the factory of the East India Company at Canton, young Staunton

proceeded a second time to China. He remained at Canton, with some occasional visits to Europe, until the year 1817, having for some time before his final return to England filled the office of chief of the factory. His residence in China afforded him the opportunity of still farther advancing himself in a knowledge of the Chinese language by means of native teachers. He was the first member of the factory that had ever studied the language of the country in which their duties required them to reside; and thus he became very useful by superseding the necessity of employing native interpreters, in whom (principally from the fear which they had of the local authorities) much confidence could not be placed. While residing in China he made several translations from the Chinese, the principal one of these, and that a work of great importance, being the 'Ta Tsing-leu-lee,' or Chinese penal code. This last was published in the year 1810. Other translations of much interest, though of inferior importance to this, have been published since.

In the year 1816 a second embassy was sent to China, the late Lord Amherst, Sir Henry Ellis, and Sir George Staunton being appointed joint Commissioners of Embassy. An account of the proceedings of this embassy has been published by Sir Henry Ellis. Sir George Staunton, however, printed his private journal, and distributed copies of it among his friends.

After his return to England, Sir George Staunton purchased a house and landed property in Hampshire, where he afterwards resided during a part of every year. For some time he had the honour of representing South Hants in Parliament. He afterwards represented Portsmouth, and continued to do so until he resigned the charge a few years before he died.

After being finally re-established in England, he occupied himself but little with any of the pursuits of his early life; though it may be that his knowledge of botany had partly led him to the laying out of an extensive garden, with numerous hothouses and conservatories full of the rarest trees and plants.

Although his life was prolonged until he had entered on his 79th year, he was always of a delicate frame, and not capable of great physical exertion. Others observed in him a peculiar shyness and awkwardness of manner, of which his education affords an adequate explanation. But with this he on various occasions displayed great moral courage and determination. Many instances of this might be quoted, but one will be sufficient. On the occasion of the last embassy the Chinese Court refused to receive it unless the

ambassadors performed the ceremony of the *ku-tu* before the Emperor. Lord Amherst and Sir H. Ellis wished that they should do so, but Sir George was so satisfied that it would be regarded by the Chinese as an act of humiliation, and something like the homage paid to a feudal lord, that he positively refused his consent. The Chinese were aware of this, and threatened to dismiss the rest of the embassy, but to detain him as a prisoner. But he declared that this made no alteration in his view of the subject; that being convinced that he was right, he was quite ready to take his chance of whatever might befall him rather than swerve from what he regarded as the strict line of his duty.

Sir George was elected a Fellow of this Society in 1830, and remained one of its Trustees until his death.

Commander Charles TINDAL, R.N., entered the Royal Navy in 1800, and was employed for two years in the Mediterranean and Channel, and during the four following years served on the home station. He received his promotion as lieutenant in 1806, and was subsequently appointed to several ships; and in 1809, in the *Narcissus*, assisted at the reduction of the various islands in the West Indies; and contributed during a cruise in the Channel, in 1810, to the capture of the privateers *Duguay Trouin* and *Aimable Joséphine*, carrying between them 28 guns and 180 men. During the ensuing summer he was employed in active co-operation with the patriots on the north coast of Spain. He also made a voyage to Newfoundland, and in 1814, being then on the coast of North America, in the *Niemen*, took command of the boats of that ship, and in a very gallant manner cut out from Little Egg Harbour the letter-of-marque schooners *Quiz*, pierced for 14 guns; *Clara* and *Model*, each pierced for 12 guns. He retired with the rank of Commander, subsequently took the management of the Branch Bank of England at Birmingham, and afterwards that in Burlington Gardens. He became a Fellow of this Society in 1834.

Rear-Admiral Henry Dundas TROTTER entered the Royal Navy in 1815, sailed in 1818 in the *Eden* for the East Indies, and in 1819 accompanied the expedition under Sir Francis Collier against Ras-al-Khyma, the head-quarters and principal resort of the pirates of the Persian Gulf. Continuing on that station until 1823, and serving in several ships, he returned in the early part of that year to England, and was promoted to the rank of lieutenant. He next served for some years in the West Indies, and was made commander in 1826. He was afterwards employed on the West Coast of Africa,

and in 1841 took the command of the disastrous Niger Expedition. Having remained on half-pay for some years, he was appointed to the command of the Cape of Good Hope squadron, obtained his flag rank in 1857, and died suddenly last year.

Admiral Trotter joined this Society in 1839, and took the greatest interest in its proceedings; he was likewise a warm advocate for the suppression of the slave-trade.

The Rev. David WILLIAMS, D.C.L., Warden of New College, Oxford, died on the 22nd of March, at Oxford, in the 74th year of his age. Dr. Williams took his degree of B.C.L. in 1809, D.C.L. in 1824; was ordained deacon in 1809, and priest in 1810; was appointed second master of Winchester School in 1810, and held it up to 1823; in 1824 was appointed head-master, and held it up to 1835. He was appointed Canon of Winchester Cathedral in 1833, elected Warden of New College in 1840, appointed Select Preacher to the University in 1841, and Vice-Chancellor in 1856 to 1858, when he resigned the office in consequence of his declining health. The Rev. Dr. Williams joined this Society at its commencement, in 1830; and at the time of his decease he was Pro-Vice-Chancellor, a member of the Hebdomadal Council, and a Delegate of Estates.

Commander James WOOD, R.N., has been a useful contributor to our hydrographical knowledge of the globe. He began his career as a maritime surveyor at Fernando Po, under the late Admiral Fitzwilliam Owen, in the year 1827. He afterwards served in the *Hecla* in the Bight of Benin, and then went to the coast of California. He next joined the *Etna*, Captain Sir Edward Belcher, and assisted in his surveys on the African coast, on the Bar of Oporto, and on Skerki Bank off Tunis. He again returned to the coast of Africa in 1834 with Commander Skyring, and, after the death of that officer, he joined the *Raven*, and was employed in the survey of the west coast of Morocco and the Canary Isles. In 1836 Lieut. Wood served with Capt. Hewitt in the North Sea Survey, and in 1837 joined the survey of the coast of Wales and the south coast of England. From this station he was appointed to command the *Pandora*, accompanied Capt. Kellett in the *Herald* to continue the survey of the west coast of America, and took share in the examination of the coasts of Columbia, Guatemala, and California, as far as Vancouver Island. On the return of this expedition to England, Lieut. Wood was promoted to the rank of Commander; and in 1855 was given charge of the survey of the N.W. coast of Scotland, and some of his plans of the Isle of Skye have been exhibited before this Society.

The climate of the North of Scotland proved too severe for a constitution weakened by exposure for many years under a tropical sun; his health gave way, and he rapidly sank on the 12th April of the present year, at the early age of 47. In the Admiralty Charts of Africa, America, and the North-West Coast of Scotland he has left a name that will long be gratefully remembered by the mariner who has to navigate those coasts.

In addition to the above names, the Society has to regret the loss of the Earl de Grey, the Rev. Temple Frere, Arthur Baily, Joseph Bainbridge, George Frederick Dickson, George Reelard Griffith, W. H. Jones, and Charles Lewell, Esqrs.

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### GEOGRAPHICAL PROGRESS.

In reviewing the progress of geography during the past year, I have adopted the practice of my predecessors, and commenced with an account of the Maritime Surveys of Great Britain; for which, as usual, we are indebted to our energetic associate, Captain J. Washington, the hydrographer to the Navy.

### ADMIRALTY SURVEYS.

The Coast surveys in course of execution, under the orders of the Admiralty, both at home and abroad, have made steady progress during the past year. They are conducted, under the able direction of Captain Washington, by twenty different surveying parties, one-half of which are employed on the coasts of the United Kingdom, the remainder in the colonies of Australia, Cape of Good Hope, West Indies, Nova Scotia, St. Lawrence, and Vancouver Island; also on the coast of Syria, in the Turkish Archipelago, in Banka Strait, China, and Japan.

*England.*—On the east coast of England the work has been confined to inserting in the charts the few topographical changes that have occurred in the rivers Tyne, Humber, and in Yarmouth Roads, in the Orwell and Thames, and in Dover Road. In the Tyne the changes have been caused by the opening of docks, owing to the increase of traffic and to some most praiseworthy deepening of the river by dredging by the River Commissioners, by which 400,000 tons of soil, and consequently of obstruction, have been removed from the bed of the river during the past year: a work that cannot fail

to be beneficial; the piers, too, at Tynemouth have made some progress. In the Thames the Conservators of the river have done great good by deepening the shoals in Blackwall and Barking Reaches, thereby removing the obstacles that prevented vessels coming up into the Pool at all times of tide. Dover Bay has been carefully re-sounded by Mr. E. K. Calver, R.N., for the first time since the erection of the pier, which has now reached a length of 1200 feet from the shore, having its outer end in 7 fathoms at low water. The result of the sounding is that a slight scour of the bottom has taken place on the inshore portion of the bay and the soil deposited farther out,—a natural result of the eddy, caused by extending a pier nearly at right angles to the direction of the tide-stream. In other respects the change is inappreciable.

On the south coast, in the neighbourhood of Portsmouth, Southampton Water, and the Isle of Wight, Mr. J. Scott Taylor, R.N., has inserted in the charts the changes that have occurred during the last twelve years, or since Captain Sheringham's elaborate survey of that region in 1848.

In the Channel Islands Commander Sidney and Messrs. Richards and Taylor have corrected portions of Alderney and Guernsey and the outlying banks and dangers; they have also sounded the remarkable dyke in the bed of the Channel, about half-way between Portland and Alderney, known by the name of Hurd's Deep, and found it to extend considerably farther to the south-west than was before supposed. Its length within the 50-fathoms edge is 40 miles, its breadth  $1\frac{1}{2}$  miles, and its greatest depth 72 fathoms.

On the coast of Devon Commander Cox with Messrs. Usborne and Davis have completed 12 miles of open sea-coast, 32 miles of harbour coast-line, and sounded over an area of 60 square miles. Off the Land's End and in the Scilly Islands Captain Williams and Mr. Wells, R.N., have filled in the soundings over a space of 650 square miles, in the course of which they discovered some rocky ground, the spot of least depth 8 fathoms, lying 12 miles N. by E.  $\frac{1}{2}$  E. of Cape Cornwall, not before noticed. A chart of the Channel, in 3 sheets, on the scale of 0·15 of an inch to a mile, has been published at the Admiralty during the past year.

In the Bristol Channel Commander Alldridge, Messrs. Hall and William Quin have completed the surveys of the eastern half of Swansea Bay, including the Neath river and Port Talbot, in the course of which work they sounded over an area of 67 square

miles. In this vicinity a chart of the coast of Wales, from St. Ann's Head to St. Bride's Bay, including Broad Sound, a plan of the port of Bridgewater, and Barnstaple and Bideford Creeks, on the scales respectively of  $3\frac{1}{2}$ ,  $2\frac{1}{2}$ , and  $1\frac{1}{2}$  inches to a mile, all by Commander Alldridge and his staff, have been published at the Admiralty during the past year. Between the Bristol Channel and the Solway Firth Mr. E. K. Calver, R.N., with his assistants Messrs. Inskip and Davison, has revised the charts and prepared for publication the sailing directions of the West Coast. The plan of Holyhead Refuge Harbour, sounded by Mr. Calver last year, has recently been published at the Admiralty on the scale of 12 inches to the nautic mile.

*Scotland.*—In Argyleshire Commander Bedford, with his assistants, Commander Creyke and Mr. Bouchier, R.N., have completed the survey of Mull, including the soundings of Lochs na Keal, Scie-dan, and Buy; also of Loch Etive on the Main, and about 20 miles of Linnhe Loch leading to the Caledonian Canal. In mentioning the names of these officers at the last Anniversary, it was accidentally omitted to be stated that, during the autumn of 1858, they, at the instance of the Refuge Harbours Commission, re-surveyed Peterhead and Fraserburgh Bays in a prompt and efficient manner, and their surveys have since been published at the Admiralty on the scale of 12 inches to the nautic mile. In Inverness-shire Commander Wood has accomplished 37 miles of the south coast of Skye, thus completing the survey of the island,\* and Mr. Jeffery has pushed forward his work in Lochs na Nuagh and Ailort, having mapped 41 miles of the coast.

In the Hebrides Captain Otter in the *Porcupine*, with her tender the *Seagull*, Lieutenant Chimmo, aided by his staff of Lieutenants Dent and Hawes and Messrs. Stanley and Grey, have examined several lochs, with a portion of the west side of the island of North Uist and the Monach Isles, and have sounded over a large area of the Little Minch.

In Harris Commander Thomas, with his assistants Messrs. Morrison and Sharban, have surveyed Loch Resort and a part of

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\* I regret to say that this was Commander Wood's last work. His long services on the West Coast of Africa with Admiral Fitzwilliam Owen, and on the north coast of America with Captain Kellett, told at length upon his constitution, and after a short illness he died on the 12th April, 1860. The mariner who frequents this stormy portion of the Coast of Scotland will have cause to remember with gratitude the name of James Wood.



Scarpa island, and the plan, on the scale of 6 inches to a mile, exhibited at one of our evening meetings, has justly elicited much approbation. This officer and Lieutenant Chimmo have very creditably continued their meteorological observations in the Hebrides, which are valuable from the paucity of such data connected with those regions hitherto available. Some charts of these coasts have been published by the Admiralty during the past year, as the north-west coast of the Isle of Mull, on the scale of  $1\frac{1}{2}$  inches, and Lochs Alsh and Duich, in Inverness-shire, on the scale of 3 inches to a mile; Loch Scriedan, too, is in the hands of the engraver.

*Ireland.*—On the east coast of Ireland Messrs. Hoskyn, Aird, and Yule have surveyed the dangerous coast between Strangford and Belfast Loughs, and a portion of the interior of Strangford Lough and Narrows. In Donegal, on the north-west coast, Captain Bedford and Lieutenant Horner have added some off-shore soundings to their charts and completed this portion of the coast. Off the south-west coast Commander Edye and Mr. McDougall have sounded the approaches to a distance of 30 miles off-shore, and determined the 100 fathoms-edge of soundings,—a valuable aid to a ship closing the coast of Ireland in a fog.

In the course of the past year several new charts of the coasts of Ireland have been published by the Admiralty, viz. from Ballyheige to Ballinskellig Bay, on the scale of  $\frac{1}{2}$  inch; Achill Head to Roonagh Head, scale  $1\frac{1}{2}$  inches, by Commanders Beechey and Edye; Roonagh Head to Dooaghtry Point, Ballynakill and Killary Bays, and Clifden and Mannin Bays, Inishbofin and adjacent coast of Galway, Sheephaven, Slyne Head and parts adjacent, Sligo and Ballysadarc Bays, all on the scale of  $3\frac{1}{2}$  inches to a mile; also Donegal Bay and Sligo and Killala Bays, on the scale of  $1\frac{1}{4}$  inches; and all from the surveys of Captain Bedford and his assistants. They form an important contribution to hydrography.

*France.*—Fourteen sheets of the west and north coasts of France, from the Bidassoa to Ushant, and thence to Dunquerque, and seven sheets of the south coast from Palamos to San Remo, on the scale of  $\frac{1}{2}$  an inch, have also been published, as well as several special plans of harbours and roadsteads, all from that admirable work the 'Pilote Français,' which reflects high honour on M. Beauteemps Beaupré and all the Ingénieurs Hydrographes engaged on it.

*Spain.*—A new chart of the north coast of Spain, from the Bidas-

soa to Cape Finisterre, on the scale of  $\frac{1}{10}$ th of an inch, has just been published at the Admiralty, as also a Plan of the Port of Santander. It is hardly credible that an error of 11 miles in longitude, in some places near Bilbao, on this coast, has up to this time existed in all the maps of Spain published in this country. This part of Spain becomes of greater interest at this moment, as the immediate neighbourhood of Bilbao and Santander is one of the best positions to view the total eclipse of the sun of the 18th of July, and it is to these places, I am informed, the greater part of the English astronomers propose to go.

*Mediterranean.*—The Moro-Spanish war has led to the publication of a chart of the Strait of Gibraltar, from an excellent survey by the late M. Vincendon Dumoulin, on the scale of  $\frac{1}{70}$ ths of an inch. On it the correct features, with the lofty summits of Monte Picachos, rising 2430 feet, on the Spanish shore, and Apes' Hill, 2800 feet, on the African shore, and the comparatively shallow depths of that remarkable strait are for the first time truly represented, the greatest depth being 510 fathoms or 3060 feet. Also a plan of Ceuta and the adjoining coast to Tetuan, on the scale of  $3\frac{1}{2}$  inches, on which is laid down the new boundary, as defined by the Treaty of the 26th of April, 1860, beginning at Khandak Rahmah, or the Ravine of Mercy, on the north, and circling round the eastern foot of Jebel Musa or Apes' Hill to the Wad Uyats on the south. The Moorish coast, with the territory of Riff, is likewise shown in a chart extending from Ceuta to the Zafarin Isles, on the scale of  $\frac{1}{4}$ th of an inch to a mile.

In the Turkish Archipelago Captain Spratt, Lieutenant Wilkinson, and the assistant-surveyors, in H. M. S. *Medina*, have brought to a close the survey of the Island of Candia or Crete, and we now have, for the first time, a correct representation of that beautiful island with its lofty central summit of Mount Ida—or, as now called, Psiloriti—towering to the height of 8060 feet; and we now learn the exact position of, and the degree of shelter which was afforded by the bay known in Scripture under the name of the Fair Havens, Kaloi Limnes of the Greeks, in which the vessel bearing the apostle St. Paul on his eventful voyage to Rome took refuge. You will be gratified to hear that the special approbation of the Lords Commissioners of the Admiralty has been conveyed to Captain Spratt, C.B., Commander Mansell, Lieutenants Wilkinson and Brooker, and Mr. Stokes, all of whom bore a part in this survey

for the skill they have evinced in producing this fine specimen of topography.

On the coast of Syria Commander Mansell, in H. M. S. *Firefly*, with his assistants Lieutenant Brooker and Messrs. Skead and Millard, have completed the drawings of the Gulf of Iskanderún, and made plans of Ayas, Latakíyah, and Beirút, all of which are in the hands of the engraver and the plans about to be published. While on the subject of Syria and Palestine, a country in which all must feel a special interest, I trust that I shall not be considered tedious if I say a few words as to the opportunity afforded by the nautical survey of the coasts now proceeding under the orders of the Admiralty for correcting the topography of the interior, for fixing the position of some of the most remarkable places, for measuring the heights of some of the principal mountains, and for the identification of places of Scripture interest.

How, too, is that admirable work the 'Dictionary of the Bible' (the first volume of which, ably edited by Dr. Smith, has recently appeared) to be completed, unless we, as geographers, contribute our share towards its perfection?

Many of our countrymen annually visit the Holy Land, and have a vague impression that there are numerous points of interest to clear up, but the very number appals them, and they do little or nothing. But if one or two special points were placed before them, according to the part of the coast they might start from, it is not improbable that they would fix their attention on those points and aid materially towards clearing away the difficulties that may attach to them.

The subject appears to divide itself into the following heads:—

1. The accurate determination of the position of important cities, mountains, &c.
2. The production of exact topographical plans of places of interest.
3. The identification of sites with Biblical history.
4. The examination of sites with reference to some special object, as the deciding between two conflicting traditions.
5. Points connected with the manners and customs of the natives which would elucidate Bible history.
6. Natural productions of any special parts of the Holy Land which would illustrate Biblical description.

7. Points connected with language, traces of ancient names, correct pronunciation of particular names, and, as far as possible, correct and uniform orthography.
8. Careful drawings of buildings and copies of inscriptions.
9. Traces of volcanic or other remarkable geological phenomena.
10. An examination and comparison of the tombs throughout Syria and Palestine.

A few examples may be cited in explanation of the above.

1. As to Geography:—

From Beirút chronometers and barometers might, without much difficulty, be carried to the Cedars, to the summit of Lebanon, to Ba'albek, and to Damascus, returning by Mount Hermon to the coast at Sidon and Beirút, where the error and rate of the chronometers could be again ascertained.

Another journey might be made from Akkah to Mount Carmel, Tiberias, Genesareth, Mount Tabor, Nazareth, returning by the plains of Esdraelon or Jezreel and Megiddo to Cæsarea on the coast.

Also from Yaffa to Shechem, Mount Gerizim, Samaria, Bethel, Jericho, Dead Sea, Jerusalem, Bethlehem, Hebron, and so to Gaza on the coast.

Seetzen, Burckhardt, Robinson, Lynch, Scott, Symonds, Porter, Van de Velde, Poole, Cyril Graham, Stanley, *etc.*, have done much for the geography of the Holy Land; but no one knows better than these later travellers how much yet remains to be done before any approach to accuracy can be attained. Damascus floats east and west some 14 miles in longitude; Gaza, although close to the coast, is half that amount, probably, in error in *latitude*.\*

The heights of cities and mountains are equally uncertain: Damascus and Jerusalem vary between 2200 and 2600 feet above the level of the Mediterranean; Ba'albek between 3550 and 4160 feet; Bethel from 1880 to 2400 feet; Shechem from 1460 to 1860 feet; the Mount of Olives from 2100 to 2700 feet; and lastly, Mount Hermon from 7000 to 10,000 feet. Here is ample work for more than one travelling geographer.

2. Topographical plans of places of interest, as Shechem, Nazareth, Jericho, Bethlehem, Hebron, &c.

3. Identification of site, as Bethabara, the place of our Lord's

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\* Some notices of the travels of the energetic Professor Wallin of Finland, in the East, are given in former volumes of our Transactions.—ED.

baptism, Mahanaim, Peniel, the forest of Ephraim, Pisgah, &c., in the mountains east of the Jordan.

The above instances suffice to show the character of the information sought.

If, then, those who take an interest in the Holy Land, and are willing to aid in the above proposal, will be so good as to transmit to the Hydrographer of the Admiralty the precise points which they consider require investigation (with a reference to the works in which the respective subjects have already been best discussed), I am authorised by him to state that the questions will be printed, sent to the surveyors on the coast, and circulated as widely as possible in the Levant, with the hope of obtaining useful answers.

*Deep-Sea Soundings.*—Before quitting the coasts of Europe, I must refer to the valuable line of deep-water soundings made by Commander Dayman in the summer of last year, from the entrance of the Channel across the Bay of Biscay, along the coasts of Spain and Portugal, and through the Strait of Gibraltar and the Mediterranean Sea to Malta. In crossing the Bay of Biscay on this line the descent from what may be termed the British Isles bank to deep water is very rapid, six times more so than off Valentia. Within 30 miles of the 100-fathoms' edge a depth of 1900 fathoms was obtained, and the greatest depth reached was 2625 fathoms. In the Strait of Gibraltar the soundings generally confirmed those obtained by the French survey of the Strait before alluded to, and the greatest depth was 510 fathoms; but a remarkable shoal spot of 45 fathoms was found about 8 miles N.N.W. of Cape Spartel in Marocco, nearly in a line joining that Cape with the coast of Spain at Cape Trafalgar—a feature in this part of the ocean, we believe, hitherto unknown. In the Mediterranean the depth in no part exceeded 1700 fathoms; and near Cape Bon, between Sardinia and Malta, deeper water was found than has yet appeared in any chart of that region. Physical geographers cannot but feel gratified that the requirements of submarine electric telegraphy conduce so much towards a better acquaintance with the bed of the ocean, of which we are still so ignorant.

Nor should I omit some notice of an expedition which is about to be despatched, to carry a line of deep-sea soundings from Scotland to the Farøe Isles, thence to Iceland, Greenland, and Labrador, with the hope of finding a route for the North Atlantic telegraph cable, where the relays shall not exceed 600 miles in length. The expedition will be commanded by our Medallist.

Captain Sir Leopold McClintock; while his companion in the late Arctic voyage, Captain Allen Young, with another Medallist, Dr. Rae, will follow in the *Fox* yacht to examine the coasts more in detail. As geographers, we must heartily bid them "God speed."

*South Africa.*—In the Cape Colony Mr. Francis Skead, R.N., Admiralty Surveyor, has corrected the general positions in False Bay and discovered two shoal spots lying about one mile to the south-west of the Cape. It is gratifying to be able to announce that on the first day of this present month of May, a bright light, revolving once a minute, at an elevation of 816 feet above the sea, and visible for a distance of 36 miles, has at length been exhibited on Cape Point. It seems extraordinary that this remarkable cape, so celebrated in the annals of navigation, first seen by the Portuguese navigator Bartolommeo Diaz in 1486, and first rounded by another equally famous Portuguese, Vasco de Gama, on the 20th of November, 1497, should for three centuries and a half have remained without a light to mark the turning-point in the high-road to India, China, and the East.

*Banka Strait.*—A new survey of this strait has been completed by Mr. Stanton, R.N., and his assistant Mr. Reed, in H.M.S. *Saracen*, in the course of which it has been discovered that a much better channel exists than has hitherto been in use. The chart of it has been immediately published, on the scale of a quarter of an inch to a mile, and is in general circulation. In the gulf of Siam six of the coast sheets on the same scale, resulting from the survey of Mr. Richards, R.N., have been published during the past year. Two sheets also of the west coast of Sumatra, on the scale of  $\frac{1}{16}$ th of an inch, with 20 plans of anchorages, from surveys by Dutch officers, have also been recently published at the Admiralty.

*China.*—The requirements of the war have led to the publication of a general chart of the coast of China, from Hongkong to the gulf of Pechili, on the scale of  $\frac{1}{1^{\circ}}$ ths of an inch to a degree. Three sheets also of the Si Kiang, or West river, on a scale of  $\frac{1}{7^{\circ}}$ ths of an inch to a mile, from a sketch survey by Lieut. Bullock, R.N., have been published, and also three corrected sheets of the Canton river, on a scale of 3 inches, and Wusung river, by Commander Ward and staff, on a scale of 3 inches to a mile. A map of the north-eastern provinces of China, from Chusan to the China Wall, on the scale of  $\frac{1}{1^{\circ}30'}$ ths of an inch, and another of the country between the gulf of Pechili and Peking, on the scale of  $\frac{1}{6^{\circ}}$ ths of an inch, have also been prepared from the best available documents by Mr. Edward J. Powell,

of the Hydrographic Office, and published by the Admiralty. In the event of a march by the allied forces on Tien-tsing or Peking, this latter map cannot fail to prove useful. We have received from our associate, Major W. S. Sherwell, Deputy Surveyor-General of India, a map of the China coast, from the Canton River to the Gulf of Pechili, with a rough outline of the provinces between Canton and Peking; several valuable remarks and statistical tables are engraved on the map, which was published, on a scale of 24 miles to an inch, at Calcutta, November, 1859.

*Tartary*.—Commander Ward and his staff, Messrs. Kerr, Blackney, Farmer, and Bedwell, in the *Actæon*, with Lieutenant Bullock and Mr. Ellis, in the *Dove* gunboat, have made good use of their time on the coasts of Tartary, Korea, and Japan. To the north we have a survey of the bay of St. Vladimir; in Manchuria, of Seau-wuhu bay, Observation spot, on the north-east side of the bay, being in lat.  $42^{\circ} 54' 14''$  N., long.  $133^{\circ} 50' 32''$  E.; in Korea Tsan-liang-hai harbour (the Chosan of Broughton in 1796), in which the north point of Deer Island is in lat.  $35^{\circ} 6' 6''$  N., long.  $129^{\circ} 1' 49''$  E.; and lastly, a survey of a magnificent sound, that divides the island of Tsu-sima into two parts. The above plans are on the scale of 3 inches to a mile, and they will be engraved and published on a suitable scale in the course of the present year, illustrated by some characteristic sketches in Korea and Tartary by Mr. Bedwell, R.N. These are positive acquisitions to the geography of little known coasts, such as it seldom falls to our lot to have to record, and they reflect great credit on the officers who, in spite of many difficulties, have persevered in accomplishing them.

*Australia*.—Captain Denham, in H.M.S. *Herald*, with his staff, composed of Lieutenant Hutchinson, Messrs. Smith and Wilds, masters, and Messrs. Hixson and Howard, second masters, have cleared away numerous reported dangers, and defined the limits of several reefs and banks in the Coral Sea during the past season. However important these new positions are, it is not necessary to enumerate them here, as besides having been published immediately on reaching the Admiralty, and being inserted in the Admiralty charts, the notice of them has been reprinted at Sydney, at the Cape of Good Hope, and in the United States, and thus within the space of three months from their discovery, the whole civilized world was furnished with the means of correcting their charts of this much frequented route, which connects Sydney with Torres Strait, India,

and China. The coasting charts, twelve in number, on various scales, published by the Trinity House, Adelaide, under the directions of B. Douglas, Esq., and accompanied by sailing directions, will be duly appreciated by mariners visiting those parts of Australia. In Tasmania, Mr. Smith, R.N., of H.M.S. *Herald*, has made a plan of Hobarton, on the scale of 6 inches to a mile, which will be immediately engraved and published. The map of Tasmania, in four sheets, scale  $\frac{1}{316,800}$ , or about 5 miles to an inch, by James Sprens, Esq., Surveyor-General, is coloured to distinguish the counties, gives soundings, and is apparently the largest and best map published.

*British Columbia.*—The surveying party, under our associate Captain George Richards, in H.M.S. *Plumper*, consisting of Messrs. Bull and Pender, masters, Lieutenant Mayne and Mr. Bedwell, second master, have, as usual, worked most industriously during the past season. They have surveyed Pitt and Frazer rivers, with the magnificent opening of Burrard Inlet, which carries water deep enough for a line-of-battle ship, up to within 3 miles, overland, to the site of the capital, New Westminster. Also parts of the east coast of Vancouver Island, with the adjacent channels, in the course of which they have examined 700 miles of coast, while Lieutenant Mayne has explored 500 miles of the Upper Frazer. They have sounded thoroughly over 420, and partially over 400 square miles, the greatest depth between Vancouver Island and the main being 230 fathoms. The coast line has been laid down on the scale of 3 inches, plans of harbours and Frazer and Pitt rivers on 6 inches, and Victoria harbour on 24 inches to a mile. Mr. Bedwell has contributed also some very characteristic sketches of scenery in these regions.

*Canada.*—In the St. Lawrence survey Commander Orlebar divided his staff of assistants into two parties; Commander Hancock, with Messrs. Desbrisay and Carey, having re-examined the river between Montreal and Quebec, and inserted all the changes consequent upon the improvements carried out by the Montreal Harbour Commissioners; while Commander Orlebar, with Mr. Clifton, returned to the coast of Labrador and the Strait of Belleisle, where several positions were redetermined, and numerous soundings taken. In the course of the survey 370 miles of coast were re-examined, and 1430 linear miles of soundings run. The charts of the Upper St. Lawrence, in twelve sheets, on the scale of 2 inches to a mile, are in the hands of the engraver, and will be published in July.



The sheets of the gulf and of the river below Quebec have all been revised and corrected in longitude according to the most recent determinations. The sailing directions by Rear-Admiral Bayfield also have been revised, and the third edition is just complete. In Cape Breton Island and Nova Scotia the following charts and plans have been recently published by the Admiralty:—Louisburg Harbour, on the scale of 4 inches; Nicomtau Bay, on 3 inches; Caraquette and Miscou, on  $1\frac{1}{2}$  inches; and Little Bras d'Or, &c., on  $\frac{1}{16}$ ths of an inch to a mile; and thus the squadron that is to accompany H.R.H. the Prince of Wales to visit Nova Scotia, New Brunswick, Prince Edward's Island, and Canada, will be furnished with the most recent charts and sailing directions that this country can produce.

*Bay of Fundy.*—Captain Shortland, with his staff, Lieutenant Scott and Messrs. Pike, Scarnell, Mourilyan, and Archdeacon, has been chiefly employed at the upper end of the Bay of Fundy, where they have examined 60 miles of open coast, and 120 miles of river and harbour shores, sounding over an area of 290 square miles. An important service has been performed by Captain Shortland in determining the limits of Le Have bank, which lies to the south-west of Cape Sable, and now that it is correctly laid down on the charts it will be useful in making the land in a fog, if vessels will only be induced to use their lead and carry a line of continuous soundings.

*West Indies and South America.*—A very creditable chart of the island of Grenada, on the scale of 2 inches to a mile, has been completed by Mr. Parsons, R.N., and his assistants, and they are now at work on the Grenadines, and proceeding to the northward to the isle of St. Vincent.

A fifth edition of the second volume of the South American Sailing Directions by our Medallist, Captain (now Rear-Admiral) Robert FitzRoy, thoroughly revised and much added to by Mr. Hull, R.N., has just been published at the Admiralty: it comprises the coast from the south point of the Rio de la Plata, through Magellan Strait and round Cape Horn to Valparaiso, Guayaquil, and Panama. A plan of Choiseul Sound and Bodie Inlet in the Falkland Isles, in the South Atlantic, on the scale of  $1\frac{1}{2}$  inches to a mile, has also been published during the past year.

*Variation.*—My predecessor in this chair, in his Address of last year, had occasion to notice with approbation the Variation Chart of the world compiled by Mr. Frederick J. Evans, R.N., of the

Compass Department of the Admiralty. This officer has since followed up the work by collecting the deviation tables of all iron ships in Her Majesty's service and the *Great Eastern*, whence he has been enabled to arrive very nearly at the laws which govern these anomalies in our compass-cards, and has prepared a valuable paper on the subject, which it is understood will soon appear in the *Philosophical Transactions*. Your late President in the same paragraph of his Address went on to urge the necessity of great caution in marking accurately on our charts the existing variation, and making allowance in shaping a course for its rapid change in some localities, pointing out that an error of a quarter of a point of the compass in a run of 500 miles would amount to 25 miles. Surely his words must have been prophetic! A few months had hardly elapsed before the iron screw steamer *Indian*, by neglecting this very caution in the short distance of 300 miles from Cape Race towards Cape Sable, ran upon the reefs upon the coast of Nova Scotia, at a spot full 40 miles out of her proper course, and became a total wreck. Let me again then urge on all engaged in the preparation of charts that they look most carefully to the variation of the compass and to its rapid change in certain localities.

Besides the surveys above enumerated as in progress in different parts of the world, the labours of the Hydrographic Office during the past year have consisted in the publication, under the immediate superintendence of Mr. Michael Walker, Chief Draughtsman, of about 80 new and corrected charts of various coasts and plans of harbours, some of which have been already mentioned. The number of Admiralty charts printed has been 148,000, of which 120,000 have been sold to the public. In addition to these have been published the usual annual lists of the 2000 lights spread all over the globe; Notices to mariners of new lights; hydrographic notices of new rocks and shoals discovered; Tide Tables for the British Isles; the time and height of high water for the principal ports in the world; and some 200 corrections in Raper's Tables of Maritime Positions, chiefly in Newfoundland, St. Lawrence, British Columbia, Manchuria, the Eastern Archipelago, and Australia.

#### TOPOGRAPHICAL DEPARTMENT OF THE WAR OFFICE.

Our Associate, Colonel Sir Henry James, R.E., has favoured me with an account of the department under his charge, which I have much pleasure in laying before the Society. It is divided into

two distinct branches, viz., the Ordnance Survey of the United Kingdom, and the Topographical and Statistical Dépôt of the War Office: previously to the year 1857 they were superintended by officers who were quite independent of each other, but since then they have been formed into one Topographical Department, and placed under Colonel Sir Henry James as Director.

*Ordnance Survey.*—A Report of the progress of the department during the year 1859 has been laid before Parliament, and from this Report we are able to state the exact progress which has been made in the Ordnance Survey up to the present time. And first, as regards the great trigonometrical operations of the survey, we learn that the principal triangulation and the principal lines of levelling in Ireland have been already published, and that the principal lines of levelling in Great Britain are in the press, and will be published this year, and complete this great branch of the work which commenced so long ago as the year 1784 under General Roy.

Along these principal lines, which are laid out as a network over the whole country, broad arrows, or the Queen's marks as they are sometimes called, have been cut upon the churches, bridges, and other permanent structures, as the exact points to be found on the ground to which the levels refer; and as the heights of these points are all given in reference to the level of mean-tide at Liverpool, they form accurate definite points of reference for those who are engaged in any great engineering operations, such as the laying out of railways, roads, canals, or the drainage of extensive districts, as well as points of reference for connecting the levelling taken within these lines in the execution of the Ordnance Survey.

It will be remembered by all who have taken any interest in the progress of the Ordnance Survey, that after the 1-inch map of England and Wales had advanced from the Land's-end to the borders of Yorkshire and Lancashire, the survey of Great Britain was suspended, that the survey of Ireland might be taken up on the scale of 6 inches to the mile; and that after all the plans of Ireland had been published on the 6-inch scale, the surveys of England and Scotland were resumed. After much discussion on the subject, and the appointment of a Royal Commission under Lord Wrottesley, it was definitely settled that the scale for the large plans of the cultivated districts should be the  $\frac{1}{25344}$ , or 25·344 inches to a mile; that the scale for the large uncultivated district

should be the 6-inch scale; and the plans on the 25·344-inch scale reduced to the 6-inch scale, to make the county plans uniform on one scale; and again reduced to the 1-inch scale to complete the 1-inch map of the United Kingdom.

The work of making these reductions, which was formerly a tedious and expensive operation, has been so simplified by the introduction of photography for the purpose, that the whole series of plans now produced do not cost more, if, indeed, quite so much, as the 6-inch plans of Ireland formerly did.

The Report then details the progress which has been made in the survey on these scales in England, Ireland, and Scotland; and we learn that as regards England, the six northern counties, viz., Yorkshire, Lancashire, Durham, Westmorland, Cumberland, and Northumberland, will be finished within this financial year. The plans of the last two counties are now in course of publication, and large parties of surveyors are employed in completing the survey of them; that of the 1-inch map of England and Wales will also be nearly finished this year.

That the 6-inch maps of Ireland have all been reduced to the 1-inch scale, and that they will all be engraved in outline in the present year, although some time must elapse before all the hill-features are sketched and engraved upon them. More than one-third of the hill features are, however, already sketched, and several sheets engraved with the hill features on them; and as the director of the survey will soon have the draftsmen engaged at present on the north part of England available for the completion of this work, we may confidently anticipate an early completion of the 1-inch map of Ireland also.

In Scotland we find that all the southern counties have been surveyed on the large scale, and that the survey is now proceeding in the counties of Perthshire and Forfarshire, and that a considerable portion of these counties has already been finished and published. The counties of Dumbarton, Stirling, and Clackmannan, were finished during the last year. With the exception of the narrow slip of cultivated country on the eastern coast of Scotland, the surveyors have now before them only the mountainous districts and the islands.

All the plans of the southern counties have been reduced to the 1-inch scale, and several of the sheets have already been published on this scale. Duplicate electrotype-plates have also been taken from some of the original copper-plates, and Sir Roderick

Murchison, Director of the Geological Survey, has published them, with the geological structure of the country represented on them. Captain Washington, R.N., Hydrographer to the Admiralty, is also supplied with the copies of the plans, and with distances and heights, to enable him to connect his hydrographical charts with the Ordnance Survey, and thus the topography, hydrography, and geology, have one uniform accurate basis.

I have referred to the advantage to the survey which the introduction of photography by Sir H. James has produced; it has enabled him to do that which would otherwise have been impossible, that is the production of the series of maps required in any time which could be possibly allowed for the work. And in this last Report Sir H. James has given an account of a method now employed for the reduction and transfer of the maps to copper, zinc, or stone, which is not only applicable to the immediate purposes of the survey, but which will be found of inestimable advantage for the production and printing of fac-similes of any printed or manuscript document, or outline engraving. This discovery is so important, that I think it will gratify the Fellows of the Society if I give a concise account of it.

The fact that a solution of the bichromate of potash becomes insoluble under the action of light is the basis of the operation; and to render this available for the purpose of printing on zinc or stone a highly-intensified negative photograph is first taken with collodion on glass; a sheet of thin tracing paper is then coated with a saturated solution of the bichromate of potash mixed with gum-water; when dried, this paper is exposed in the printing-frame, under the negative, for two or three minutes in the light. The action of the light through the lines or writing makes that part of the composition insoluble, while the remainder remains soluble, and can be removed. To effect this the bichromate positive is laid on a sheet of zinc, previously charged with lithographic ink, and passed three or four times through a printing-press. On taking the paper from the plate the entire surface is uniformly covered with ink; but on submerging the paper in a shallow vessel of hot water with a little gum in it, and gently brushing over the surface with a flat camel-hair brush, all the soluble portion of the composition, with the ink attached to it, is removed, and the outline of the MS. or print is produced quite perfect, and charged with ink, and, when dried, it is at once ready for transfer to zinc or stone or the waxed surface of a copper plate. Sir H. James has called this art Photo-zinco-

graphy; and its value for the purpose of copying and printing at a trifling cost facsimiles of ancient MSS. and rare documents, now locked up and inaccessible to the public, must be obvious to every one.

A specimen of this art is given in the Report on the Survey; and we have seen several others, which leave no doubt either of the importance of the discovery or of the perfection to which the art has already been brought on the Ordnance Survey.

#### TOPOGRAPHICAL AND STATISTICAL DÉPÔT.

While the operations of the Ordnance Survey are confined to the production of the maps and plans of the United Kingdom, the Topographical Dépôt is designed for the collection of the most accurate maps of our colonies and every part of the world, with such statistical information as bears more immediately upon the military resources of every country.

Within the last year a catalogue has been printed of all the maps, plans of fortified places, and charts which have already been collected in the Dépôt; and the Secretary of State for War, impressed with the importance of making this collection as perfect as possible, has appropriated an additional portion of the grant for this year for the purchase of such maps and plans as are still wanting.

The work of the Ordnance Survey is conducted by the officers and men of four companies of the Royal Engineers and a great number of civil assistants; but for the work of the Topographical Dépôt Sir H. James has the assistance of one officer from each of the following services, viz. Artillery, Engineers, Infantry, and the Navy, the special acquirements of officers from these branches of the service being required for the effective conduct of this branch of the department.

The Report gives a full detail of the great amount of work which is executed in the Dépôt, and which includes the plans of colonies, battles, sieges, &c., as well as the vast number of circular letters and orders required by the War Department.

Among the maps is one of Europe, showing the boundaries of every state as arranged by treaties, with the dates of the several treaties; and on this map the position of every coal-field in Europe is shown, with returns of the produce and nature of the coal in each.

Plans of every barrack and fort in Her Majesty's dominions are

in course of publication, and two volumes have already been published.

Returns of the strength, organization, and equipment of every army in Europe have been compiled from the most authentic sources, and a great quantity of other work which it would be tedious to detail; but some idea may be formed of the extent of the work performed in the Topographical Department, from the fact that 190,000 plans were published during the last year.

The Topographical Department has constantly to furnish officers and men for the surveys of the colonies; and we observe from the Report that, during last year, Lieut. Bailey and a party of Royal Engineers have been sent to the Cape of Good Hope, and other parties to British Columbia, Belize, and Malta.

#### METEOROLOGICAL DEPARTMENT OF THE BOARD OF TRADE.

In the Meteorological Department of the Board of Trade (and Admiralty), under the guidance of our excellent Medallist, Admiral R. FitzRoy, much has been effected during the last two years by simultaneous observations at many places, in addition to the registration of atmospheric occurrences sedulously carried on at sea and on land in many parts of the world.

Practically, these extensive observations of facts, occurring in various climates and under a variety of conditions, from arctic or antarctic regions to those of the tropics, have directly tended to prove the uniformity of those laws by which our atmosphere is governed and the differences of climates determined.

Meteorology, which had been thought a complicated and vague subject, has approached the character of an exact science; and the tabulated labours of many observers in successive periods of years during the last two centuries have begun to bear fruit in their present usefulness to practical as well as to theoretical students of atmospherical phenomena.

It is now by no means difficult to estimate the climate of any place of which the geographical position is known.

The hours of highest and lowest temperature and barometric pressure, the normal height of the mercurial column, and the prevalence of moist air, rain, or dryness, much or little cloud, &c., can be predicated approximately for any part of the world, although in that particular place no observations may yet have been made.

More than this, however, and more directly valuable, is our confirmed knowledge of the "laws of storms," and our further

acquaintance with the nature and succession of the prevalent or various winds over the earth and ocean.

Consequent on the recorded observations of numerous contributors \* to meteorological science, we have now a general and, in some branches, a detailed acquaintance with the subject; we have good instruments and tables, and the use of them is better known.

Her Majesty's Government has endeavoured to diffuse practical knowledge of winds, weather, currents, storms, and climates, not only among mariners engaged in voyages to distant regions, but among the coasters and fishermen along our own shores.

Instruments and instructions have been liberally lent (at the public expense) to selected captains of ships; while other such aids, of a kind expressly suitable, have been similarly lent to more than thirty of the most exposed and least affluent fishing-villages.

The hardy populations of these places have already derived much benefit and have strongly expressed their sense of gratitude for the use of these barometers, thermometers, and plain instructions; while the registers returned from numerous ships among the finest of our merchantmen, besides men-of-war, now constitute a mine of valuable maritime and scientific information.

Among many results indirectly or immediately flowing from the recorded observations on board so many ships thus supplied by Government with reliable instruments, verified at the Kew Observatory, has been one which cannot be too widely known among voyagers,—namely, that near the equator, between five and ten degrees of north latitude, the range of the barometer is so small and so regular, as to time, that any such or similar instrument may be verified, while crossing that zone, more satisfactorily than by a removal to the shore for comparison with a standard, a test also of the utmost value to meteorological records made on long voyages with uncomparred instruments.

Another simple result deduced from multiplied observations, and as important as it is simple, is that in a gale or storm, while facing the wind, the centre of the circling or cyclonic current of the atmosphere is to the *right* in *north* latitude, but to the left in the southern hemisphere.

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\* Dampier, Halley, Hadley, De Foe, Franklin, Cook, Capper, Flinders, Redfield, Dové, Daniells, Kämtz, Espy, Sabine, Reid, Piddington, Herschel, and Humboldt, besides many other original observers; and compilers, among whom is the popular Maury.



Not that these rules are without occasional apparent exceptions—apparent rather than real—caused by a second, perhaps even a third cyclonic (or oval) eddy impinging on the first circulation, either horizontally or angularly (with reference to the horizon).

The *first* movement may be likewise more or less inclined to the horizontal plane, if not occasionally almost vertical, as in a “*descending squall*.”

Such phenomena are readily explicable, after due consideration of Dové's theory of polar and equatorial currents (translated and published by the Board of Trade), and they are so marked by “*weather-glasses*” that it is now inexcusable to navigate without them or to undervalue their warnings.

Why the barometer rises and falls, *how* it and its indispensable companion the thermometer are affected by a coming change, are questions often asked by the inexperienced in their use, and may be answered here in a few sentences (from the Meteorological Department) for the benefit of such young travellers or voyagers as have yet the world and its marvels before them.

“Cold, dry air, coming from a polar direction, is heavier in specific gravity than warm, moist air (containing gas or aqueous vapour) flowing from tropical or equatorial regions.

“The normal condition of our atmosphere is a continual rising and westward movement of inter-tropical, or rather *sub-solar*, atmosphere, consequent on its expansion, and being lightened by the sun's action while the earth is rotating on its axis.

“This rise and westward impulse is accompanied by general movement, from polar directions, to fill the space that would otherwise become *comparatively* vacant. Air, like water, seeks equilibrium, but, unlike water, it is *very* elastic and *excessively* mobile.

“Yet air, however rarefied, cannot rise beyond a certain distance. Cold and gravity check its elevation. It must, however, move onwards somewhere. Having momentum, and being pressed behind by ever-rising air, it overflows (as it were) the polar under-currents and moves towards those regions which the polar currents have quitted and are *continually quitting*. But those regions are vastly smaller in area than the equatorial, and opposition, if not a conflict, occurs soon between the main streams or currents, so unequal in breadths and characters.

“Portions of the overflowing quantities from the sub-solar regions combine, between the tropical limits and near thirty degrees of latitude, with the normal and general movement (called trade-

winds or monsoons), and other parts divide, mix with, or oppose the polar currents in a variety of ways, between the tropics and arctic (or antarctic) regions.

“Such currents sometimes flow side by side, though in opposite directions, as ‘parallel streams,’ for hundreds or even thousands of miles.\* Sometimes they are more or less superposed—perhaps, or indeed *frequently* crossing at various angles;† sometimes combining, and by the *composition* of their forces and *qualities* causing those varieties of weather that are experienced as the wind veers more toward or from the equator or the nearest pole; and sometimes so antagonistic in their angular collision as to cause those large circling eddies or rotatory storms called cyclones (in modern parlance), which are really like the greater storms in all parts of the world, although they do *not* quite assimilate to those local whirlwinds, dust-storms, and other commotions of atmosphere which are more *electrical* in their origin and characteristics.

“Whenever a polar current prevails at any place or is *approaching*, the air becomes heavy, and the barometer is high or rises. When the opposite (tropical or equatorial) prevails or approaches, the mercury is low or falls, because the air is, or is becoming, specifically lighter, and these changes take place *slowly*.

“Whenever, from any cause—electrical, chemical, or simply mechanical—either current, or any combination of currents, ceases to press onwards‡ *without being opposed*, a *gradual* lightening of the atmosphere, through a greater or less area of hundreds, or perhaps thousands, of miles occurs, not suddenly, but very gradually, and the barometer falls.§

“To restore equilibrium, the nearest *disposable* body of air (so to speak) moves first; but an impulse, at the first time, may have been given to other and greater masses that—though later in arriving—may be stronger, last longer, and cause greater pressure mechanically as well as by combination. Air, like water, mingles but slowly, either from above or laterally.

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\* Like Sabine's currents of the sea, on the coast of Africa.—‘Pendulum Experiments.’

† Green, Rush, and Welsh.—‘Balloon Ascents.’

‡ If *opposed* mechanical pressure increases; and this may be caused by high land, as well as by opposing wind.

§ Evaporation, rarefaction, or condensation of vapour in air, reduces its specific gravity—the two former by expanding bulk, and rendering it lighter; the latter, through mechanical diminution of quantity, by falling to the earth as rain, &c. Moreover, there is more or less motion, *away* from the place of stationary air, which tends to lessen its elasticity or pressure, and cause the barometer to fall.

“Taking, with Dové, north-east and south-west as the ‘wind-poles,’ all intermediate directions are more or less assimilated to the characteristics of those extremes; while all the variations of *pressure*, many of those caused by temperature, and all varieties of winds, may be clearly and directly traced to the operations of two great normal currents—equatorial or tropical, and polar.”

Young travellers, and more particularly intending voyagers, may find this subject systematically, though popularly treated, according to the views of Herschel and Dové, in recent publications of the Board of Trade.\*

#### AMERICA.

*Arctic.*—The award of the Founder's and Patron's Medal to Lady Franklin and Sir L. M'Clintock by the Council of this Society, and their reasons for coming to this conclusion, dispense with my entering into as much detail as would otherwise be required in that portion of my present review which relates to the Arctic regions.

It is no small satisfaction to me, however, to have to record in the annals of the Society, during the year of my Presidentship, such remarkable events as the solution of the fate of the *Erebus* and *Terror*, through the efforts of Captain M'Clintock and his officers, and the revelation of the discoveries of Franklin by the attainment of the only written document which has rewarded the search during a period of twelve years. This document, buried thirteen years ago in a spot so lonely that not even the feet of the wandering Esquimaux ever approached it, has crowned the latest of the Arctic expeditions with a success and a renown which the preceding ones perhaps equally merited, but were not so fortunate as to obtain. In combination with other memorials which fell under the notice of the exploring parties from the *Fox*, this rustworn, tattered, but precious document leads us to believe that our unfortunate countrymen, the pioneers and the martyrs of the last decade of Arctic exploration, perished in the accomplishment of their mission and placed the keystone into that wide arch, built up at intervals during many generations, which connects the Atlantic and Pacific Oceans. In giving to the Franklin Expedition the honour of being the first discoverers of a North-West Passage, it needs not to be explained that there is scarcely an individual name known in Arctic

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\* Sold at the cost of paper and printing only, by the Government agent, Mr. Potter, in the Poultry, London.

navigation for the last forty years which has not given a helping hand to the solution of this great problem ; but, in speaking of the amount of discovery, it is but fair to state that, out of the 2060 miles which intervene between the discoveries of Baffin from the side of the Atlantic, and those of Cook from the Pacific—in other words, the north-west passage between the two oceans—no less than 1260 miles were explored and navigated under the command of Sir J. Franklin himself, either by boat or ship. In his last fatal expedition, upwards of 560 miles of unknown waters were navigated by the *Erebus* and *Terror*, which vessels, previously to taking up their quarters at Beechey Island for the first winter, pushed their explorations as far north as  $77^{\circ}$  N. lat., when, having satisfied themselves of the impossibility of finding a passage in that direction, they returned to Beechey Island by a channel to the west of Cornwallis Island, and in the following summer proceeded in the direct execution of their mission by taking a southerly course towards the coast of America, in order, if possible, to obtain a connection with those already known waters extending from Back River to Bering Strait. In the month of September, 1846, they attained a position off the north-west point of King William Island, or, as the Admiralty chart of that day represented it, King William Land, it being supposed to form part of the continent. They were here distant but 90 miles from the channel which had, many years before, been navigated along the coast of North America, and *which it was Franklin's object to enter*. In the following spring, before the navigation was open, a party was detached from the ship to follow the coast-line of King William Land to Cape Herschel, and thus connect the recent discoveries with those of former years. A marginal note of later date, on the same document, records the death of Sir J. Franklin in June, 1847, and the abandonment of the ships in April, 1848, by the survivors, 105 in all, who, under the command of Captains Crozier and Fitzjames, commenced their retreat on the Back River. Beyond the last-named date we have no written evidence of their proceedings. They *must* have been in a state of great debility and disease, dropping one after the other, though some were able to reach as far as Montreal Island in the estuary of the Back River, where remains of clothing and equipment were found, but no skeletons, as upon King William Island.

The labours of Captain McClintock and his companions have not only procured for us this authentic information as to the proceedings of the Franklin Expedition, but have added materially to our geo-

graphical knowledge ; 600 miles of new coast-line have been discovered, and the gap completely filled up between the old and the new discoveries along the continent of America, thus enabling us correctly to delineate on our maps the most northern extremity of the New World and supply the deficiency which the absence of any detailed account of the voyage of the *Erebus* and *Terror* has left. Independently of the interest which these exciting discoveries have created in the public mind, the simply told narrative of Sir L. M'Clintock will remain a standard work among voyages and travels, and the admiration of his gallant conduct in persevering in the object of his voyage after the discomfiture of the first year will remain an example to after ages.

A very interesting addition to the remarkable voyage of Dr. Kane has been recently added by the publication, by Mr. Bentley, of Dr. J. L. Hayes' narrative, detailing the proceedings of a portion of the crew of the *Advance*, which left that vessel in Van Rensselaer Bay in August, 1854, and lived among the Esquimaux for several months. Influential meetings have been held by the different scientific societies in the United States, with a view to raise subscriptions to enable Dr. Hayes to return to the scene of his labours under our lamented Medallist, Dr. Kane, and follow up his explorations towards the Pole. Should a sufficient sum be raised, it is his intention to proceed to Smith Sound this summer, and go to the north along the coast of Grinnell Land.\*

Professor B. Silliman, in a letter to Sir R. Murchison, relates that a gentleman from Cincinnati, with *one white* companion and several Esquimaux, intends proceeding in a New London whale-ship in search of a portion of Sir John Franklin's men, whom he believes to be still alive. And our own countryman, Mr. Parker Snow, formerly second in command to Captain Forsyth, in Lady Franklin's discovery ship *Prince Albert*, proposes to make another attempt to ascertain the details of the fate of the lost expedition by renewing the search for those journals, records, and other traces which he expects will be found during an exploration *in summer*, when the ground is free from its winter covering. The proposal has met with the approval of several of our highest Arctic authorities. Mr. Snow hopes to be able to proceed through Bering Strait, and to follow the line along the American continent so successfully adopted by Captain Collinson.

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\* Dr. Hayes has since sailed from New York.

Mr. Alderman T. Hopkins, in a paper read before us, proposes to reach the Pole, by proceeding to the north, between Spitzbergen and Nova Zembla. He presumes that as Parry met with a southerly current in the meridian of Spitzbergen, a contrary one will be found farther to the east, and, from the prevalence of south-westerly winds, it is his opinion that high land will be found near the Pole.

The scientific expedition proposed by the Swedish Government to explore Spitzbergen and the North has, as our associate, Count Platen, informs us, been postponed until next year, in order to be more fully organised.

*Proposed North Atlantic Telegraph.*—Though not an Arctic subject—as the line which Colonel Shaffner of the United States proposes to lay the Atlantic telegraph does not come within the polar circle—yet as it is one in which the opinion of officers experienced in ice movements will have great weight, I am induced to place it in this portion of my Address. The difficulty experienced in rapidly transmitting messages throughout a great extent of wire induced Colonel Shaffner to turn his attention to a route by which, in every probability, there will be required no continuous length beyond 600 miles. After a careful investigation at his own expense last year, he believes that he has found suitable places for the termini of the wires in Labrador and Greenland, whence he proposes to lay the cable to Scotland by way of Iceland and the Farøe Islands. Some deep-sea soundings along this route have been obtained which denote a maximum depth of 2000 fathoms, and many of the Arctic navigators are of opinion that the fear of rupture by icebergs may be entirely obviated by a judicious selection of fiords up which the cable may be carried.\*

*British North America.—Palliser's Expedition.*—Accounts have been received from our Medallist, Captain J. Palliser, of the safe arrival of himself and party at Colville on the Columbia River, where, in compliance with his instructions, his explorations cease.† After spending the winter at Fort Edmonton, during which season several arduous journeys were performed on the snow by himself and the Geologist, Dr. Hector, which contributed largely to the geographical results of the expedition, Captain Palliser, having organised his party, proceeded towards

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\* See page 152.

† Captain Palliser and his scientific companions have since returned to England.

the South Saskatchewan River, following the course of Red-Deer River. By reaching within a few miles of the point from which he turned in his first season's explorations, and thence proceeding westward to the Rocky Mountains, keeping between the South Saskatchewan and the Boundary line, he thus completed the survey of the great and hitherto unknown Prairie region. His Report shows that the arid tract which is known to occupy the centre of the North American continent extends for at least  $2^{\circ}$  into British territory. The greater portion of the country adjacent to the South Saskatchewan and Red-Deer River he found to be deficient in moisture, and only supporting a very scanty pasture. At the Cyprière Hills, however, which lie about 40 miles north of the frontier line, in long.  $111^{\circ}$  w., there is abundance of wood, water, and grass.

After thus spending the early part of the summer in completing the exploration of the eastern prairie country, he despatched Dr. Hector to traverse the mountains by a northern route, while, accompanied by the Astronomer, Mr. Sullivan, he himself crossed by the Kutanie Pass to Fort Colville.

From that point Mr. Sullivan explored eastward towards the Rocky Mountains, and describes a succession of transverse valleys by which a road, striking the valley of the Kutanie River by either the Kananaskis or Vermilion Pass, could be continued westward within British territory. At the same time Captain Palliser continued an examination of the country to the west of the Columbia, likewise keeping within British territory, until he met the Boundary Commission and also Lieutenant Palmer, R.E., whose reconnaissance of a trail from Lower Frazer River to Fort Colville has also been laid before this Society. As likewise, by the valley of the Okanagan River, there is known to be an easy communication with the gold mining region, the connection of the Saskatchewan plains east of the Rocky Mountains with a known route into British Columbia may be considered as one of the chief results accomplished by the expedition. Dr. Hector, after leaving Captain Palliser, followed up the South Saskatchewan, and crossed the mountains by a "pass" in the neighbourhood of the 52nd parallel, when, after striking the Columbia and within 60 miles of his exit on Thompson River, his exploration was closed by the advance of winter and the want of provisions, while forcing his way through timber so dense that he could not penetrate faster than from three to four miles a day. He reports, however, that he encountered no physical obstacles to the

construction of road, so far as he explored. The absence of game, and the difficulty of carrying provisions, owing to the luxuriance of the forest growth, appear to render the exploration of the country to the west of the Rocky Mountains an extremely difficult and expensive task.

The results of this most important expedition will in due time be laid before the Society, and published in its Journal.

*Hind's Expedition.*—Great credit is due to the Canadian Government for the energy with which they have pushed their explorations into the vast region lying to the west of Lake Superior and the country drained by the Winnipeg, Red River, and the Saskatchewan. The reports of the Assiniboine and Saskatchewan expedition under the charge of Professor H. Y. Hind,\* introduce us to a large tract of country respecting which comparatively little was known. The great lakes of the Winnipeg basin, embracing a water area exceeding 13,000 square miles, are bounded to the west by the abrupt and precipitous escarpments of the Riding, Duck, Porcupine, and Pas Mountains, which bear marks of their having once been an ancient coast line, when the ocean was relatively 1600 feet above its present level; the low region east of these mountains being the result of denudation. On their western flanks these ranges descend in steps and gentle slopes to the fertile valleys of the Assiniboine and Swan rivers, and are densely wooded with valuable forest trees. The area of arable land of the first quality between the Lake of the Woods and the Grand Forks of the Saskatchewan is estimated by Professor Hind to exceed 11,000,000 acres; and an additional area of equal extent is fitted, even in its present condition, for pasturage.

Wheat and Indian corn have been grown at all the posts of the Hudson Bay Company, and at the missionary stations scattered over this belt of fertile country. Although the low region east of the Riding and Duck Mountains, and partly occupied by the Great Lakes Winnipeg, Manitobah and Winnipigo-sis, is generally unfit for the permanent habitation of civilized man, yet it has been found to contain an inexhaustible supply of that great necessary of life, common salt. The brine springs occupy a strip of country extending from the 49th to the 54th parallel, and thence towards the valley

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\* North-West Territory. Reports of Progress; together with a Preliminary and General Report on the Assiniboine and Saskatchewan Exploring Expedition. By Henry Youle Hind, M.A., in charge of the Expedition. Printed by order of the Legislative Assembly, Canada, 1859; also in a Blue-Book, Eyre and Spottiswoode, London, 1860.



of the Mackenzie. In the cretaceous shales, which form the base of the country drained by the Little Souris, and part of the Assiniboine, clay iron-stone of remarkable purity and in great abundance has been found to exist, while on Battle River and the north branch of the Saskatchewan Dr. Hector discovered an abundant supply of lignite coal.

West of Assiniboine the country furnishes limited areas well suited for settlement, but the south branch of the Saskatchewan flows through a region which from its aridity will probably never be generally occupied by civilized man.

A very important and curious feature in the surface of the great prairie-plains drained by the Saskatchewan and the affluents of Red River is the numerous deep river-channels, which cut the country to the depth of 300 and even 400 feet. The most remarkable example is that of the Qu'appelle river and valley, which form a continuous water communication from the south branch of the Saskatchewan at the Elbow to the Assiniboine near Fort Ellice. The entire length of this valley was traversed, partly in canoe and partly on horseback, by Professor Hind's expedition, and instrumental measurements were taken of its leading dimensions. Its least depth is at the height of land, 12 miles from the Elbow of the South Branch; here it is 110 feet deep and one mile broad. From a small lake in this part of the valley, water flows both to the Saskatchewan and the Assiniboine, 257 miles to the east. The narrow lakes in this valley have a depth of 66 feet, and are 57 miles long in the aggregate; the bottoms of the lakes in some instances being about 350 feet below the prairie level. Other communications between the South Branch and the Assiniboine exist besides that of the Qu'appelle valley, showing that the prairie-plains which they intersect have probably been subjected to a slow but continuous process of upheaval, whereby river-courses have been changed and the numerous Elbows originated, which form such a curious feature in the prairie rivers of the basin of Lake Winnipeg.

With a vast area of fertile soil, and a climate favourable to the cultivation and growth of wheat; with lignite coal, iron-ore, and common salt in abundance, a great future is probably in store for the Basin of Lake Winnipeg. Lying between the rich gold-fields of British Columbia\* and the powerful, populous, and wealthy colony

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\* *Vide* Papers relative to the Affairs of British Columbia, Part III. Blue-Book, 1860; and page 155 of this Address. —ED.

of Canada, it is only a question of time how soon its vast capabilities and resources will be developed, and that position assumed when, as a British colony, it will also become instrumental in carrying British institutions, associations, and civilisation across the continent of America.

*Dawson's Expedition.*—The expedition under Mr. S. J. Dawson, C.E., undertaken with a view of ascertaining the best route from Fort William to the River Saskatchewan, has resulted in giving us considerable information and several maps of the country.

In a paper addressed to the President and Council of the Society, our associate, Captain M. H. Synge, R.E., who for several years has devoted much attention to this subject, earnestly appeals to the Society in favour of the British North American Route, as shorter, quicker, more favourable as to winds and currents, more salubrious, more comprehensive, inviolable, perfect in its water-communication, and causing the colonization of British North America in great part. Captain Synge briefly adverts to the enhanced value of the project caused by the events of the last few years.

*Mexico.*—Our learned Corresponding Member, Professor Paul Chaix, of Geneva, has forwarded to us an interesting account of an excursion to an ancient volcano in Mexico, which will appear in the next volume of our Journal.

*Central America.*—*Honduras Interoceanic Railway.*—From a Report which has recently been published, it appears that the survey has established the following facts—that Port Cortez, on the Atlantic (lat. 15°49' N.) and Fonseca, on the Pacific (lat. 13°21' N.), are both first-class harbours; that across Honduras is a perfectly practicable route for a railway of 220 miles in length to connect those harbours. Mr. Trautwine, the superintending engineer, reports that the result of the survey is the establishment of the interesting and important fact that there exists through Honduras a perfectly feasible route for a railway, with natural harbours at its ocean termini, the existence of which must be regarded as a controlling feature in an enterprise like that proposed, and which derives peculiar importance from the fact, that throughout the entire extent of Central America there occurs no similar instance in combination with a route so favourable as that developed in the survey.\* Colonel Stanton, R.E., reports that the harbours are unexceptionable, and that the road can be constructed without any sharper curves or heavier grades than are to be found on existing lines over which locomotives work without difficulty.

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\* See 'President's Address' for 1859, p. ccviii.

Mr. Maximilian de Sonnenstern, for many years engaged in surveying Central America, is engaged in publishing his map, in four sheets, which will comprise Guatemala, Honduras, Salvador, Nicaragua, and Costa-Rica.

*South America : Ecuador.*—Several papers which have been communicated to the Society must not be passed over without the special mention they deserve. Our forthcoming "Journal" will contain the narratives of no less than three travellers who have been engaged in explorations of the State of Equador, namely, of Mr. G. J. Pritchett, who traversed the greater part of it in various directions in the years 1856 and 1857; of Mr. Spruce, a botanist (for whose Journal we are indebted to Sir William Hooker), who, proceeding from Tarapoto, in Peru, to Baños, in the State of Equador, passed down the river Huallaga to the Amazon, and thence, ascending the rivers Pastaza and Bombanaza to Cañelos, visited the great volcanic regions of Chimborazo and Cotopaxi, and the eastern portion of the provinces of Leon and Quito, collecting information regarding the natural products of those countries, which is of great interest; and lastly, of Mr. Jameson, who has resided for many years at Quito as a Professor in the University, and has sent to the Society an account of a tour which he made last year, during one of his vacations, as far as Cayambe.

The narratives of these gentlemen comprise a considerable mass of original information regarding the State of Equador and its natural resources. I may also add that we have received a copy of the map of that Republic, by Dr. Villavicencio, mentioned as in course of publication by my predecessor in his Address in 1858.

*Chile.*—Mr. Wheelwright's gigantic project of a railway over the Chilian Andes, from Copiapo and across the Argentine provinces to Rosario on the river Parana, an account of which was read before the Society in January last, has led to a survey extending no less than 350 miles over the Great Cordillera of the Andes, and thence across the slopes and plains beyond, to the river Parana, a copy of which, accompanied by sections, has been communicated by Mr. Wheelwright to the Society, and will be found full of interesting matter connected with the climatology, mineral and other products of those hitherto undescribed regions.

The Government of Chile is making progress in extending civilization to the south of that Republic in the direction of Patagonia, among fertile plains occupied by savage people; but capable of supporting large populations, whenever the tide of emigration may set in that direction. In Chile the working of the coal veins

is being greatly extended. This increase of production is of great importance, not only to the steam vessels of all nations frequenting the Pacific, but also to the various copper and silver melting establishments in that productive mineral country.

*Brazil, &c.*—The railroads now in course of construction from the Atlantic coast into the interior of South America, as at Pernambuco, Bahia, and San Paolo in Brazil, will not only be of benefit to commerce by developing the resources of these vast countries, but also lead to a more accurate and familiar geographical knowledge of them. Our own Captain Sullivan and Captain Page of the United States navy, by their interesting river-exploration have already, as you know, thrown great light on the capabilities of the fertile regions on the western frontier of Brazil as well as of the Argentine provinces.

*Patagonia.*—H. M. Minister at the Argentine Confederation has communicated to us letters on maps of Patagonia, by Mr. H. L. Jones, which assist in throwing some light on this unexplored region of the world.

*Tierra del Fuego.*—Since the Admiralty Survey of this portion of South America by Admiral R. FitzRoy, in 1830-36, little has been done to open out its natural resources. Mr. Parker Snow has partially examined the islands in the vicinity of Cape Horn, and found good harbours with fresh water supply, with easy access to vessels, where they might refit any damage sustained in rounding the Horn. A fresh survey of these parts is much needed, to make known its harbours, develop its resources, and bring its yet savage inhabitants in communication with the civilized world.

*Falkland Islands.*—These islands afford many harbours of refuge, as shown by the surveys of FitzRoy, Robinson, and Sullivan; many parts are fertile and productive. At present Stanley Harbour is the principal Government station, but the missionaries have stations on the western islands.\*

#### AFRICA.

Geographical science has made considerable advance in the African continent since our last Anniversary. The labours of Captains Burton and Speke are published in our Yearly Journal,

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\* For other mention of these subjects see Captain Washington's lucid sketch of Admiralty Surveys during the past year; and for the important records of geographical progress in the United States of America, I must refer to our Medallist, Professor Bache's Coast Surveys, the Journal of the Geographical Society of New York, and other excellent works published in America.

which is almost wholly occupied with an account of their expedition, from the pen of its leader: so ample in its contents, so rich in observation, so minute in description, as to make us marvel at the energy of the man who, prostrated and half-paralysed with fever and its consequences, nevertheless continued to observe, question, and note down the enormous number of facts therein contained, that elucidate the ethnology and condition of negro society in Eastern Africa.

The result of the careful mappings of Captain Speke is appended to Captain Burton's Paper. Full justice has now for the first time been done to his work. For the astronomical observations have been re-computed by Mr. George at the Society's rooms; the itineraries and bearings have been examined and collated, and his data protracted with the greatest care by Mr. Findlay.

The nature of every-day life among the negroes of Eastern Africa as pictured in numerous lights in Captain Burton's pages, is one that cannot fail to leave a painful impression on all lovers of the human race. It is not only the reckless cruelty of the people that shocks us, nor their slave-dealings nor marauding propensities, nor their degrading superstitions and incurable indolence, for we are fully prepared to accredit any rude race with all or any of these qualities, but it is the picture of one unbroken spread of vulgar, disunited, and drunken savagery over the entire land, connected apparently with fewer redeeming qualities than are possessed by any other race with whom previous travellers have made us acquainted. In fact, it is hard to discover a single trait in East African character, as described by Captain Burton, upon which we are able to dwell with pleasurable recollection. The very features of the land have a repulsive aspect. His description leaves us with the idea of a fever-stricken country that is skirted by a wide, low-lying belt of overwhelming vegetation, dank, monotonous, and gloomy, while it reeks with fetid miasma.

The difficulties in the way of a thorough exploration of this country seem enormous. The porters and servants of an expedition in this land of rude equality are insubordinate, and held together by the slightest possible restraint. They act on impulse, abandoning their loads and decamping at slight temptations, while hardly any inducement can persuade them to violate routine by deviating the smallest distance from the established track. The tyranny of custom, as well as the tyranny of brute force, is established in these lands with a power that we, nurtured in freedom, find it hard to conceive.

The distribution of races throughout Eastern Africa is a subject on which Captain Burton has given us a large mass of material. The time is however hardly ripe for a full examination of this subject. Other expeditions are in progress, to which we shall shortly refer, from whose joint results, together with what is now before us, we may hope soon to learn with tolerable accuracy the broad features of the ethnography of Africa. Whether, for instance, the South African races are or are not separated by a sharp line of demarcation from those of North Africa; and again the number and direction of the chief lines of ancient migration. Captain Burton shows some cause to connect the appearance of the Caffre races in South Africa with the pressure exerted in the interior by the first spread of the great kingdom (now utterly broken up) of the Wanyamesi.

Most of what we positively know of the physical features of the land in question is to be seen at a glance in the map. We there trace the route of the expedition, its sectional elevation, and a part of the shores of the two lakes Tanganyika and Nyanza, the former of which was partly navigated, the latter only reached by the expedition. We do not know from the certain evidence of the eye-witness of our travellers what the affluents of the former lake really are, nor whether it has any outlet. Neither of the two ends of the Tanganyika were visited owing to the want of proper boats and the obstruction of the natives. We have in consequence no better authority than that of native testimony for the tributaries represented as entering the lake at its northern and southern extremities. The configuration of the country to the northward gives us excellent reason to believe that the northern tributary is correctly described; but whether the river mentioned as *entering* the lake at the south does not really run *out of it* is a fair matter for discussion.

It is indeed a strange hydrological puzzle if a lake, situated in the damp regions of the equator, subject to a rainy season that lasts eight out of the twelve months of the year, and supplied by considerable rivers, one of which is stated to be saline, should have no outlet whatever, and yet retain its elevation unchanged, its evaporating area invariable, and also the sweetness of its waters uncompromised. We may speak to much the same effect of the lake Shirwa, lately visited, but not yet thoroughly explored by Dr. Livingstone. To make the matter more strange, we find the Nyassa lake closely adjacent to the Shirwa, and not far distant from the Tanganyika, and of approximately the same elevation, gives exit to a splendid river, the Shiré, which Livingstone describes as

being at its outlet 150 yards broad, 10 to 12 feet deep, and running at  $2\frac{1}{2}$  knots an hour. Lastly, there is this farther unexplained peculiarity, that, contrary to the Zambesi, and to the properties of all rivers in Tropical Africa, the variation in the height of the Shiré in the wet and dry seasons does not exceed the remarkably small amount of 2 or 3 feet.

Now if we venture to disregard native testimony altogether on that one point in which native testimony is perpetually misleading travellers, namely, the direction of the current of a river, the facts at present before us appear not only not contradictory, but even lend considerable probability to the theory that the Nyassa is connected with the Tanganyika, and that the Shiré may be the outlet of both of them, and also to the surplus waters of the Shirwa.

First, as to the elevation above the sea of the water-levels of these lakes. Speke places the Tanganyika at 1844 feet above the sea. Livingstone places the Shirwa at 2000. He has not yet given us the altitude of the Nyassa, but he reports that its waters are described as being separated from those of the Shirwa by a mere spit of land, which assuredly would be flooded in *some* seasons (if the Shirwa had no kind of outlet), and a water-way worn between the two lakes if there were not a free intercommunication between them through a porous soil, if by no more direct channel. In this way the surplus waters of the Shirwa might find an ultimate outlet by the Shiré.

Next, as to the recorded depression of 166 feet of the Tanganyika below the Shirwa or the Nyassa. This quantity is far too minute to be relied on as accurate, considering the nature of the observations employed by the two travellers, which were simply the record of the temperatures of boiling water, corrected for the temperature of the air. This simple and excellent method of determining heights approximately is wholly unreliable in a case like this unless special precautions be taken, and certain comparisons be made which have not been made in the present instances. For example, the thermometers require to be verified at the close of a journey as well as at its commencement, because their index errors are found to vary continually by a slight but accumulative change. Speke's thermometer had varied  $1^{\circ}$  Fahr. from first to last, which represents an altitude of 535 feet. Again, the variation of barometric pressure, though small between the tropics at sea, is even there sufficient to cause an error of 100 feet in any one observation, or a differential error of 200 feet between two observations, supposing the variation to have acted in opposite directions; and the

variation is greater on shore than at sea. There are other distracting causes, well known to observers, which I need not dwell upon here, having already said enough to show that we cannot rely for a moment on the recorded differential altitude of 166 feet between the two lakes. All that we are justified in saying at the present moment is that the three lakes, Tanganyika, Nyassa, and Shirwa, appear to be of about the same level, and that it is quite possible the Tanganyika may be the highest of them all. If it be so, and if the Tanganyika be connected (it may or may not be through a chain of small lakes) with the Nyassa, we should have an immediate solution of all our difficulties. The surplus waters would be accounted for, and the non-variation of the height of the Shiré river would also be accounted for, because the rains, as they followed the course of the sun, would never entirely leave the lake district during any part of the year. It is a district that would extend with more or less intermission in a long meridional strip of no less than  $13^{\circ}$  of latitude, beginning with lat. s.  $16^{\circ}$ , and ending with lat. s.  $3^{\circ}$ .

Far be it from me to press forward this solution in an undue manner. African geographers have too much cause to distrust geographical speculations; but I wish clearly to point out both the magnitude of the hydrological difficulties which embarrass us, and also the wide limits within which our speculations are obliged, for the present, to rove, in the absence of a few fundamental facts.

Captain Speke has again set sail for Africa. He has started, accompanied by our associate Captain Grant, under fair auspices again, and bound for the discovery of the sources of the Nile. This Society has abundant reason to acknowledge the liberal spirit in which Her Majesty's Government has acted in supporting this expedition. Captain Speke's instructions are to make the best of his way to the point whence he before turned back, at the southern end of the lake Nyanza, and thence to explore to its northern extremity, seeing whether or no it has a northern outlet. If there should be no connection between the Nyanza and the Nile, he is to use the best of his judgment in prosecuting his search to the sources of the latter, and finally he is to endeavour to reach Gondokoro, the missionary settlement formerly occupied by Knoblecher, and stated to be in N. lat.  $4^{\circ} 25'$ .

We are rejoiced to say that Captain Speke is not the only traveller on the Zanzibar coast. Dr. A. Roscher, a native of Hamburg, proceeded to Zanzibar in 1858, and in 1859 travelled along the coast as far as Kilwa, and explored the lower course of the Lufiji. In a



letter dated Zanzibar, November 21, 1859, he is said to have been met half way to the Nyassa. A Hanoverian gentleman, the Baron von Decken, who is known as a keen Algerian sportsman, and who is by no means unversed in the manipulation of geographical instruments, has already set sail for Zanzibar with a view towards a lengthened wandering among the Kilimandjaro range.

Consul Petherick's daring overland expedition to the southward of the Bahr el Ghazal is a successful feat that has taken all African geographers by surprise. The weapons and utensils that he has brought back from the interior are exceedingly curious; among them we find iron boomerangs, with sharp cutting edges, a most fearful instrument in savage warfare. The Bari people, who use them, are the only others in the world besides the Australians who appear to have discovered the singular properties of that strange projectile. The interest of Mr. Petherick's journey is very great, for he introduces us to an entirely new race of negroes, and its value will be largely increased when either his own astronomical observations, on a future occasion, or those of Captain Speke, shall have localized with certainty the scene of his late exploits. We have, farther, to acknowledge Mr. Petherick's valuable advice and offers of assistance in regard to Captain Speke's relief, should that officer reach Gondokoro.

From our enterprising associate, Mr. Cyril Graham, we learn that, wishing to go to Thebes, and not desiring to accompany the travellers passing up the Nile, he went to Suez, and embarked on board a vessel, with 300 Hagijis, bound for Mecca. They ran along the western shores of the Red Sea, until they reached "Cosseir," in lat.  $26^{\circ}$  N., where he landed, and proceeded towards Thebes. After four and a-half days' camel travelling, he reached Thebes, and passed through a country peopled by blacks, called Ababech. There was no water between this place and the Nile; a spring is found two days south of Cosseir, which supplies that place. The country crossed abounds in valuable mineral productions, as green and red porphyry, much prized by the Egyptians 5,000 years ago. To the south of this are gold and silver mines, although much exhausted. Mr. Graham remained 15 days at Thebes, and then started for the desert, and, travelling northward, reached Cairo in safety, after making the circuit in 37 days, over nearly 1,000 miles. Mr. Graham says that this journey had never been made before, and that he was repaid by the discovery of several interesting inscriptions. Here Mr. Graham remained a few days to translate a valuable Arabic MS., and then intended leaving for Syria to spend

the summer, and then re-visit the Haurán, hoping to penetrate into Arabia.

Our eminent explorer, Dr. Livingstone, has added largely to his former laurels by his explorations of the Shiré and Shirwa. I need not here recapitulate what has already appeared from time to time in the published "Proceedings" of this Society, and is, doubtless, familiar to all of us. His vessel, the *Ma Robert*, has, for some time, failed to satisfy his needs; and he awaits, in company with the remainder of his party, a new steamer, promised by the Admiralty, and now being constructed.\* Mr. R. Thornton, the geologist, has quitted the party, and is at the present time conducting an expedition on his own behalf, of which some few scanty tidings have reached us.

Although much zeal is being shown by the Portuguese, in collecting and publishing the ancient and modern travels of their compatriots in Africa, it is remarkable that the numerous travellers of whom we have more or less information, should have contributed to so small an extent as they have done to a knowledge of the geography of South Central Africa.

This fact shows, in unmistakeable colours, the wide difference between a mere transit from one point to another, and that of a scientific exploration of a line of route. Unless the day-book be accurately kept, and astronomical observations be made from time to time, the narrative of a traveller is almost sure to become a chaos to the student. This has been the case with Portuguese discoverers generally, with the sole exception of Lacerda, who died in Central Africa more than half a century ago. The journey of Silva Porto, which was read some months since before this Society, and which will appear at length in its next Journal, is perhaps the most instructive of the mere narratives. It will be recollected that he was selected by the Governor of Angola as the most proper person to accept the proffered safe conduct of those Arabs who had previously crossed the continent from the eastward, and were about to return; and that he did return with them to Mozambique, and passed Livingstone, as that explorer issued for the first time from the interior; and that he had crossed Africa and reached the Eastern coast about the same time that Livingstone first emerged at the western. Silva Porto's journey, running as it does roughly parallel

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\* The *Pioneer* has just started, under the command of our associate, Mr. D. May, R.N.

to that of Livingstone, and to the northward of it, affords not a few points for comparison and verification, which have been ably discussed by Mr. J. Macqueen, and illustrated by a map which will be published at the same time with his paper. Perhaps at some future date the zeal of African geographers will give us, in a condensed form, the tangible results of Portuguese discovery from the earliest times—a subject of much historical interest, and not without present geographical importance. For the present we depend, in matters of South Central African geography, almost wholly upon what we have learnt from Livingstone, Lacerda, Burton, and Speke. For a knowledge of the exports, and imports, and commercial capabilities of the Mozambique coast of Africa, we are largely indebted to the various data collected by Mr. McLeod, late H.B.M. Consul of that place.

On the western coast of Africa, Mr. Andersson's arduous attempts at traversing an exceedingly wooded country, along a line untravelled by caravans and requiring the constant use of the axe for a distance of some 300 miles, ended in that explorer reaching what appears to be the southernmost branch of the head-waters of the Zambesi. His progress was checked by a severe fever that had prostrated him and most of his party for a space of four months. His discovery makes it improbable that the course of the Cunene should be so long, and, consequently, that its volume of water should be so great, as native reports to the south of that river had represented it. It is easy to conceive that men living in an otherwise arid land should have their imagination deeply impressed with a perennially flowing river, and that an exaggerated reputation of its size should have penetrated to the dwellers in the bush and Karoo. The times are indeed changed from those in which, some few years ago, the Orange River of the colony was the northernmost running water of which English travellers had certain knowledge, excepting only a portion of the then far-famed Limpopo. Now, the Karri-harri Desert has been crossed by many tracks; the lake Ngami, which then was usually considered a myth, has been long since searched out and overpassed; and the great length of the mighty Zambesi is familiarly known.

Through our honoured Associate, Sir William Hooker, we have received some very good memoranda of a Trading Trip into the Orange River Sovereignty, and the country of the Transvaal Boers, in 1851-2, by Mr. J. Sanderson, which will be published in our Journal, with a map by Arrowsmith.

Farther to the north I have to direct your attention to a remarkable exploration by Du Chaillu, an American naturalist, of French descent, sent out by the Academy of Philadelphia. I speak of his discoveries in the equatorial regions of West Africa. That traveller, during a period of four years, spent in wanderings in pursuit of natural history, which has resulted in a very valuable collection, discovered that what had been hitherto considered as two distinct rivers, namely, the Nazareth and Mexias, running into the sea at *lats. s.*  $0^{\circ} 41'$  and  $0^{\circ} 56'$  respectively, are, in fact, the delta forming mouths of a single important stream, which also inosculates and in part discharges itself through the Fernando Vaz or Camma. His travels extended to a very considerable distance in an easterly direction. He found the main stream, called the Ogobai, to be formed by two enormous tributaries, the Rembo Apingi to the south and the Rembo Okandu to the north. He reached the former of these at an estimated distance of 350 miles of travel from the western coast, and found it a noble stream, 500 yards broad, from 3 to 4 fathoms deep, and running with great force.

Dr. Barth suspects the Ogobai to be the lower part of that river which he made out from information as running westward many days' journey south from Wadai, and he believes there is a vast field for future discovery along the northern branch of that river, viz. the Rembo Okandu. Du Chaillu has thus opened access to that great drainage of which Bowditch had already collected so much information, and we have now unexpectedly found an immense river—a rival, perhaps, in length and importance to either the Congo or the Zambesi, apparently more accessible to Europeans than either of them, and running into the sea at the very *waist* of Africa (if such an expression be permitted), the very place whence the central part of the equatorial regions of that continent may be reached at the least distance from the coast.

The results obtained during the last year by Dr. Baikie are not yet in our hands, neither does a decision appear to have been yet arrived at concerning the future destination of this expedition. Lieutenant Glover, R.N., has arrived in England from the Niger, and is preparing his surveys for the Admiralty.

A report has been circulated referring to a contemplated expedition of the French by two military detachments, the one from Senegal, and the other from Algeria, to converge upon Timbuctu. In the mean time the district even immediately adjacent to Algeria is so far inaccessible to the French that the recent journey of

Duveyrier to El Golea has justly earned the character of a daring adventure, and the often-repeated offer of a prize has induced no French traveller to hazard the dangerous route that is proposed to be followed by large caravans.

An Arab, M. Ismael Bonderba, educated in France and attached as interpreter to the "Bureau Arabe," has published an interesting account in the '*Revue Algérienne*' of his excursion from Algeria to Ghât. To the south of Wargla he traversed the region of sand and sand-hills termed El Edj, extending on one hand to the south of Golea, and on the other to Ghadamis. This enterprising gentleman had already before this made a journey from Hed Suf to Ghadamis in 1857. According to M. Bonderba's barometrical observations, Mr. Ravenstein informs me that the elevation of Laghnat is 2340 feet above the sea; that the land falls thence to the oasis of Wargla, and at Negussa the elevation is only 120 feet. From Wargla to Ghât the land rises again, and it appears that the drainage of this part, as far as the Jebel Noggur, is towards the Sahara of Algeria, enabling the French to obtain a large supply of water by means of artesian wells. The altitude of Ghât is 1830 feet, or considerably more than has been assigned to it by Overweg.

Some interest and probably no small degree of future importance is connected with the geographical researches which have, within the past year, been made by enterprising persons of African race.

Information has been received from the remarkable African republic of Liberia that the Messrs. Amos have returned from a tour of observation to the Falls of the Sinoa River, which place they recommend as the site of a future mission. Mr. Miller had just reached Monrovia from a tour to the Golah country, where also a mission is contemplated.

A much more considerable exploring expedition has been sent out by the Liberians. It occupied at least six months, and appears to have been ably performed by the Liberian travellers, Seymour and Ash. Though making no pretensions to scientific acquirements, they have furnished a very interesting narrative which is continued through many numbers of the '*Liberia Herald*.'

They reached the city of Quanga, situated in a mountainous region, a part of the Kong Mountains. Quanga is a large walled town, 2500 paces in circumference, having five gates, from which there are roads leading to other cities and towns. They state this city to be 287 miles from Monrovia, 384 from Grand Bassa, and

14 days' march from Sierra Leone. Sierra-Leone English is understood by some of the people.

In the course of their journey they visited several other large and populous towns, having well-constructed mud walls 12 feet high and 4 thick. The scenery is described as very diversified, and in some places charmingly beautiful. The population of the country is remarkably industrious; not merely having very extensive tracts under cultivation and raising a great variety of crops, including rice and corn, but exercised in many kinds of manufacture, weaving thousands of yards of cotton cloth, and working in iron and other metals. In some places the people may be considered wealthy. The women in one of the towns are described as beautiful; their clothing white cotton cloth, and their ornaments so rich that 30 dollars' worth of gold might be worn by one person. The quantity of silver was beyond the travellers' attempts at estimation.

Cattle, sheep, and goats appear to abound, and some of the cattle are very fine. Horses, which are said not to live in Liberia, were seen near the city of Quanga, and are valued at from 40 to 60 dollars.

It would not be doing justice to these African travellers to omit stating that they collected specimens and statistical information, noticed the natural history and geology of the country, made some ethnological and medical observations, and enquired into the religion of the inhabitants. Mahomedanism has been introduced by the Mandingoes, to whom these people are allied, but it seems to have a slight hold upon them. It is believed they would readily receive Christian instruction.

It was very evident that important commercial relations might be formed with the people whom these travellers visited. They received the strangers with almost universal kindness and interest; and the only serious difficulty which occurred, and which was nearly being fatal to both travellers, arose from their own imprudence in not sufficiently attending to the advice and direction of one of the head men.

A letter from Alexander Crummell, an American of African descent who received a part of his education at Cambridge, has been forwarded to Sir R. Murchison. It was dated from Cape Palmas, towards the southern extremity of Liberia, and gives some particulars of a journey up the Cavalla River to the distance of about 85 miles, near which point the navigation of this fine river

is interrupted by a fall and dangerous rapids. Other falls are said to exist 15 miles higher up the river.

The most remarkable, and as to its results that which is likely to prove the most important of the late explorations of coloured travellers, is that from which Dr. Delany and his companion Mr. Robert Campbell are just returned. They both proceeded from the United States; the former going direct to Africa, the latter coming to England, where, through the generous kindness of our members, Dr. Hodgkin, Henry Christy, and other gentlemen, he was provided with his outfit and free passage to the coast of Africa.

The travellers met at Lagos; and, by a journey full of interesting incident and productive of much valuable information, and giving them frequent important and promising intercourse with the natives and their chiefs, they reached the city of Alorie, situated about 400 miles from the coast, and in the route from the coast to the upper waters of the Niger; a course which, while the difficulties of navigating that river remain to be overcome, affords the most promising outlet for the productions of this part of Africa.

It should be stated that these travellers undertook their interesting tour on behalf of an Association of coloured Americans, who are anxious to find in the land of their forefathers a refuge from the slavery which weighs them down in America; and they hope, with justifiable ambition, to become the means of elevating the natives of Africa, while finding a fit scope for their own unrestrained energies and talents. The travellers have well performed their mission, and appear to have found an open door. They will doubtless soon give to the public, as well as to those who delegated them, the fruits of their researches.

We have already learnt from them that they found large and populous towns of industrious people. The cultivation of the ground is so extensively carried on that in one district they rode for seven hours through a continued succession of corn-fields, interrupted only by paths and a few bushes. Looms were extremely numerous, and considerable variety of manufacture was carried on. The horses in use among the people were some of them remarkably good, resembling the Arab breed. It will be remembered that our own able African traveller, E. Bowditch, when he visited the Ashantees, found at Cromane a solitary horse which the people had not learnt to use, and that he broke the animal for the king.

Dr. Delany and Mr. Campbell experienced great advantages in their African descent and appearance, and were received as

Europeans could not have been. They obtained by formal treaty, in which they were assisted by the well-known native African episcopal clergymen, Mr. Crowther and his son, the facilities and promise of toleration and protection which they sought for their constituents; and it must be added that this successful tour of nine months' duration on the continent of Africa cost them less than 100%, which forms a striking contrast with our expensive expeditions.

#### ASIA.

*Syria*.—From our excellent associate, Sir Woodbine Parish, we have received the account of Sir Eyre Coote's journey from Bussora to Aleppo, which has been strongly recommended to be printed in our Journal, by no less an authority on this subject than our associate, Mr. Cyril Graham.

From Dr. J. Wortabet, M.D., we have also received an original MS. on the Hermon, and the physical features of Syria and Palestine.

*Persia*.—Our associate, Captain Claude Clark, has furnished us with a valuable paper on routes from Tehrán to Herát, then to Shahraad, and Tehrán to Bushir.

*Caucasus*.—Baron de Bode, the well known traveller, has given us a lively sketch of Hilly Daghestán, and the Lesghi tribes of the eastern chain of the Caucasus.

*Kuria Muria*.—A lively account of the Kuria Muria islands, by Dr. Buist, has been published in our Proceedings.

*Hindustan*.—In the past year we have had only two papers on the subject of the greatest of our dependencies, but these have been on a highly interesting portion of them—the mountain valley of Kashmir, the country of the Shawl, and the celebrated retreat of the Mogul sovereigns of Delhi from the sultry heats of the summers of the plain. These communications were in illustration of a beautiful MS. map of the Trigonometrical Survey of Kashmir, submitted to the Council by the India Office, and exhibited at one of our meetings. It represents the physical features of the country, and has been constructed, with great labour and care, under the direction of our medallist Colonel A. S. Waugh, by our associate, Captain Montgomerie of the Bengal Engineers, and is now being lithographed by Mr. J. Walker, Hydrographer to the Hon. E. I. Company, and will shortly be published. Here, at an average height of 6500 feet above the sea-level, we have a population, by race Hindu, occupying a country which in physical geography, animal and vegetable pro-



ducts, bears no small resemblance to Switzerland. The authors of these able contributions towards our better knowledge of Kashmir are two gentlemen connected with the celebrated Trigonometrical Survey of India, begun by Lambton, carried forward by Everest, and now about to be brought to a conclusion by Waugh, after sixty years' indefatigable and skilful labour. We can form to ourselves some notion of the difficulties encountered in the Himalayan portion of this vast undertaking, when I state that, out of the sixteen principal stations of the Survey, fourteen were 16,000 feet above the level of the sea, and two 18,000—that is, 3252 feet higher than Mont Blanc. Our best thanks are due to the authors of these papers, Captain H. Godwin Austen and Mr. William H. Purdon.

Before quitting the subject of Hindustan, I may bring under your notice the extent of our dominion in that region; and this I do on the authority of Colonel Waugh, the Surveyor-General of India. Our own territory amounts, in round numbers, to 800,000 square miles, and that of our tributaries to 500,000; the aggregate of these sums forming a country six-fold greater than Imperial France, and twelve times the extent of our own islands. You will allow me to congratulate you on the restoration of tranquillity to this vast empire, and the total suppression of an insurrection of unheard-of extent, in which deeds of constancy and valour have been exhibited by our countrymen, and, indeed, also by our countrywomen, which have elevated the national character. We have even already, and within three short years of the Sovereign's direct assumption of the government of our great dependency, evidence of advancing prosperity in the increase of commerce, the great bond which unites peoples to each other. Exclusive of a large trade with other nations, we ourselves received from India, in the last year to which the returns have been completed (1858), merchandise, many articles of which were unknown to our forefathers, to the value of from fifteen to sixteen millions (15,742,528*l.*), an increase in five years' time of above four millions (4,308,117*l.*). Exclusive of eleven millions' worth of gold and silver, we sent the people of India merchandise in the same year to above eighteen millions' worth (18,387,588*l.*), being an increase in five years of near eight millions (7,948,487*l.*), or of 76 per cent. The greater part of our exports consisted of British manufactures of which, half a century ago, it was supposed the Hindus were incapable of becoming consumers.

Eleven sheets of the Great Trigonometrical Survey of India have this year been added to the Atlas, making 61 sheets published, and several more are in the hands of the engraver.

*The Hindu-Chinese Countries.*—From the vast region which geographers have frequently designated by this name, and which embraces 16 degrees of longitude and 13 of latitude, all intertropical, our Society has had within the year three papers. The scanty inhabitants of this great region, as yet so imperfectly known to us, may be very briefly sketched. The race of man, a peculiar one, would seem to be one and the same throughout, but it is found in two very different states of social existence. The most advanced possesses an ancient civilisation, and the most considerable nations of them are the Arracanese, the Burmese, the Peguans, the Shans or Laos, the Siamese, the Cambodians, and the Anamites or people of Cochin-China and Tonquin. But scattered among these are a rude people, composed of many distinct tribes speaking for the most part distinct languages, without knowledge of letters, and with but slender knowledge of agriculture and the common arts of life.

It is of the last of these people, under the designation of Karen, which seems a general term of the Burmese language for a rude or uncivilised people, that we have an account of some tribes inhabiting the countries ceded to us by the Burmese, in the elaborate Diary of Mr. Edward O'Reilly, a functionary of our government in Pegu, and a gentleman well skilled in the Burmese language. The more civilised nations above enumerated have systematic forms of religion, generally that of Buddha, received from India; while the rude tribes have only loose superstitions. It is among the latter that the propagation of Christianity has been successful to a degree, indeed, unknown in any part of India, it being computed that not fewer than 40,000 of them have been converted within the last thirty years. The credit of these conversions is due to the American mission in Burmah, the founder and leader of which was the late excellent, amiable, and prudent and judicious, though zealous Dr. Judson.

The second paper on the Hindu-Chinese countries is by a Fellow of our Society, our Consul in Siam, Sir Robert Schomburgk. This describes a journey which the Consul himself made from the Siamese capital, Bangkok, to a town on the western coast of the Gulf of Siam called Pecha-buri, never before described. Sir Robert Schomburgk has, I believe, suggested the feasibility of a ship-canal, or at all events of a railway across the Isthmus of Kra, which would

connect the Gulfs of Bengal and Siam, and so save the longer passage to China through the Straits of Malacca; but as no details of this scheme have yet been laid before the Society, it will be sufficient to indicate the existence of the project.

I may here briefly refer to the extraordinary progress which the foreign commerce of Siam, but more especially our own trade with it, has made in recent years. Forty years ago there was hardly any European trade with this kingdom; and I find that in 1856 the number of European vessels that entered and cleared out from Bangkok amounted to fifty, importing cargoes to the value of near 400,000*l*. This has been chiefly owing to the remarkable man who at present rules this remote country—a man who speaks and writes our own language, who has introduced the printing-press, and who possesses a considerable steam fleet. I may, indeed, describe him as a kind of Asiatic “Peter the Great” on a small scale.

Our third paper on the Hindu-Chinese countries is in the form of a letter from a French naturalist, M. Mouhot, and relates to the little-known country of Cambodia, or, more correctly, Kamboja—a poor kingdom, reduced to very slender dimensions by the usurpations of the Siamese to the north and of the Cochin-Chinese to the south. M. Mouhot's letter is dated in October last, and from the station of a Catholic French Mission called Brehem, in the country of a rude race called the Stien, “*Chez les sauvages Stien*,” in lat.  $11^{\circ} 46' 30''$ , and long.  $103^{\circ} 3'$ . M. Mouhot had crossed the Mekong or Great River of Cambodia on his route to the missionary station in question, and describes it as not less than three miles broad, and containing many large islands. At no great distance above where he crossed this great stream, he describes it as obstructed by falls, so that it is not navigable for probably above 200 miles from the sea.

A full and very interesting account of Cambodia will be found in the volume of our Journal now printing, compiled by our associate Mr. James Campbell, Surgeon in the Royal Navy, from the papers of the late Mr. Forrest and of the Rev. Dr. House. To ourselves and to other European nations Cambodia is at present an object of considerable interest, for within it the French have lately formed an establishment which is likely to be a permanent one. This consists of the town of Saigon, on a river of the same name, and situated about 50 miles from the sea. The river for navigation is probably the finest of Asia west of the Yang-tse-kiang, the country an alluvial one of eminent fertility, and the position as against any Asiatic enemy an impregnable one. The

neighbouring country is very thinly inhabited; but, by a liberal introduction of Chinese emigrants, and sound commercial regulations, Saigon may become a valuable emporium and a convenient harbour of refuge to ships damaged by the storms of the China Sea.

*China.*—In the course of the past year we have had but two communications to add to the large stock supplied to us in the previous one by such eminent contributors as our Associates Sir John Davis, Captain Sherard Osborn, Mr. Laurence Oliphant, and Dr. Macgowan of the U.S. The first of these papers, which we owe to the kindness of one of our Fellows, Mr. Hugh Lindsay, is the diary of Mr. Mickie, kept by him in a voyage from Shanghai to the Gulfs of Pecheli and Laotung. In the course of his paper, this accurate and very intelligent traveller furnishes us with new and valuable information on the hydrography, topography, and climate of the countries he saw. One fact he brings to our knowledge, of which we were but partially informed before, that, through the distracted state of China and the consequent extent of piracy on its coasts, the carrying and coasting trade of the country is in a good measure carried on in European shipping instead of Chinese junks.

The second communication is contained in a letter to Dr. Shaw from Lieutenant Lindeſay Brine, R.N., and gives a very instructive account of the Si-kiang or West River, which has been usually called by us the Broadway, and sometimes the Blue River. This stream, hitherto unvisited by Europeans, was found by the expedition under Captain M'Cleverty, R.N., which ascended it in February of last year, to be a broad navigable river to the length of 75 miles.

Respecting the vast empire which has now become so important to us, I shall only state a few broad facts which appear to me of great interest, not only to the geographer but to the statesman. It is well known that a census of the population of China was taken in 1812, which made it in round numbers amount to 360,000,000. Another has recently been taken which raised this large sum to 412,000,000, showing that during forty-eight years the inhabitants of China had increased by 52,000,000—or little short of double our own numbers at the census taken ten years ago. Always closely pressed for the means of subsistence, the people of China are of course at present more so than at any previously known period of their history, and hence the emigration which is going on beyond all precedent with this home-loving people, and this to such remote countries as Australia, California, and even the

Antilles. Her Majesty Queen Victoria has at present in Hong-kong, in her Malayan colonies, and in Australia, not fewer than a quarter of a million of Chinese subjects, among whom are to be found wealthy merchants and large ship-owners.

This singular people, more numerous than all the other people of Asia put together, and in a far larger proportion more ingenious and laborious than the most civilised of them, is so addicted to a commercial intercourse with strangers that they may be truly said to carry it on in despite of their own government—ever, from fear, adverse to foreign intercourse of whatever description. Just now we are at war with China, yet our trade with it goes on as if we were at peace, and such has been the case in all former periods of hostility.

It will be instructive to mention a few prominent facts connected with our commercial intercourse with China. Thirty years ago, our importation of tea, a necessary of life to the whole Anglo-Saxon race, did not exceed 30,000,000 lbs. In 1858, the last year to which the public returns have been made up, it had risen to 75,432,535, of the value of 5,206,618*l.*, and yielding a revenue of 5,186,170*l.* The raw silk with which the Chinese supplied us thirty years ago was a trifle hardly worth recording. On the average of the last three years it was of the value of 4,284,472*l.* In the two articles of cotton and opium, the Chinese take not less than 18,000,000*l.* of our Indian produce, the last of these articles yielding a revenue to the Indian Treasury little short of that which tea yields to the English, with this material advantage, that it is not our own subjects but the Chinese who pay the tax.

The Chinese do not take our own productions and manufactures to the extent that might be expected from so numerous and industrious a people, still our exports to China are on the increase, for in 1858 they had risen to 4,119,573*l.*, exclusive of 6,000,000*l.* of silver, which we were enabled to send by exchanging it for our manufactures and for the gold of Australia, whereas four years before they were no more than 1,505,409*l.*, which shows, even in this short period, an advance of no less than 173 per cent. Altogether, it is computed that no less than 50,000,000*l.* of British capital are engaged in the trade of China.\*

We have also received from our associate, Major W. S. Sherwill, Deputy-Surveyor-General of India, a map of the China coast, from

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\* For other notices on China see Admiralty Surveys.

the Canton River to the Gulf of Pecheli, with a rough outline of the provinces between Canton and Pekin. Several valuable remarks and statistical tables are engraved on the map, which is published on a scale of 24 miles to an inch, at Calcutta, Nov., 1859.

*The Indian and Philippine Archipelagos.*—On the subject of the great Indian and Philippine Archipelagos we have received in the past year no communications; but two of our Fellows, Lieutenant De Crespigny, of the Royal Navy, and the eminent naturalist Mr. A. R. Wallace, former contributors of valuable information, are still on this promising field, in which Dutch geographers have in recent years reaped a rich harvest of knowledge. To show that this considerable portion of the globe is of much moment, it will be sufficient that I state a few facts which have been tolerably well ascertained respecting it. The number of its islands and islets has been computed at 6000, the thirty largest of which are computed to have an area of 700,000 square miles, or seven times the extent of Great Britain and Ireland. The Dutch possessions, including tributary States, have been computed to have a population of 17,000,000, the Spanish of 5,000,000, and our own of 250,000, or one-twentieth part of the last of these. But the external commerce of the three nations is in a very different ratio to that of their populations, for our own joint export and import trade last year was 16,430,152*l.*, the Dutch 14,747,414*l.*, and the Spanish but 2,160,000*l.*

*Japan.*—On the subject of this empire, with its computed 30,000,000 of inhabitants, and its considerable but very eccentric civilisation, its climate, sometimes partaking of our own, sometimes of that of the most southern parts of Europe, and sometimes approaching that of Kamschatka, we have in the past year no contributions towards our knowledge. Practically, indeed, we know nothing of this great country beyond having seen a very few of its towns, and a small extent of its highways. Not a man among us has acquired its language; and, in a word, it may safely be asserted that there is no part of the world of equal importance so little known to civilised Europe. It is earnestly to be hoped that a better understanding with the Japanese, than at present exists, will extend the bounds of our knowledge of them and their country.

#### AUSTRALIA.

The communications made to the Society on the subject of this continent (we have long and justly ceased to call it a mere island) have been most important. They in fact embrace great

practical discoveries of new and available territory. In the prosecution of these discoveries, what Mr. Burke calls "the dexterous and firm sagacity of English enterprise" has never been more eminently displayed. Among the most eager of Australian discoverers must be ranked His Excellency Sir Richard Macdonnell, the Governor of South Australia, who in his own person gives a signal example of the precepts he lays down for the conduct of the subordinate officers of his government. We are indebted to the courtesy and geographical zeal of the Secretary for the Colonies for Sir Richard's public despatches, and from these, and an interesting private letter of his own addressed to my predecessor, we have an account of one of his journeys. In the course of this expedition, which extended over seventy-seven days, he rode 1800 miles, penetrating the continent to the 28° of latitude, bivouacking at night, and seeking shelter in the day from a heat sometimes reaching 115° of the thermometer, under the scanty shade of a few branches of the scrub.

Under the auspices of Sir Richard Macdonnell, Mr. William Randell performed last year the most remarkable achievement in steam navigation which has yet been accomplished on the Australian continent. This consisted in a voyage on the Darling, extending by the windings of the river to 2400 miles from the sea, and to 1800 reckoning from the junction of the Darling and Murray. The Darling in its long course has but a single fall of about 8 feet in several hundred yards, an obstruction to its navigation only when its waters are at the lowest; so that we have here a great water way into the interior of the continent, and already on the fertile banks of the Darling many runs have been established.

Mr. Macdougall Stuart, whose discovery of a well watered country in Southern Australia, equal in area to half that of Ireland, was brought to our knowledge last year, is, by the most recent accounts, prosecuting new discoveries with the hardy intrepidity which characterised his previous one, and which called for the marked approbation of our Society, and the substantial reward of the local Government.\*

The coasting charts, twelve in number, on various scales, published by the Trinity House, Adelaide, under the superintendence of B. Douglas, Esq., and accompanied by sailing directions, will be duly appreciated by mariners visiting those parts of Australia.

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\* Through the Duke of Newcastle, H.M. Secretary for the Colonies, a gold watch was forwarded to Mr. Stuart from this Society.

On the north-eastern side of the continent, and towards the southern limits of the new government of Queensland, a very important discovery has been made, consisting of a capacious harbour sheltered from every wind. The territory within which this harbour exists is on the eastern slopes of the Australian Alps, and is therefore probably well watered, which is equivalent to its being fertile, since it lies close to the Tropic. Should this turn out to be the case, it will most likely be found well adapted to the growth of cotton, the sugar cane, and even coffee. In this event an abundance of suitable labour only will be wanting, which can be supplied by a liberal importation of Chinese immigrants. By favour of the Duke of Newcastle, the despatch of His Excellency Sir George F. Bowen, F.R.G.S., describing the new harbour, has been furnished to us.

The map of the colony of Queensland, by Mr. L. F. Landsberg, extending from the parallel of 22° S. to 28° S., and to about 5° from the coast, exhibits considerable detail.

The map of Tasmania, in four sheets—scale  $\frac{1}{31,800}$ , or about 5 miles to an inch, by James Sprent, Esq., Surveyor-General—is coloured to distinguish the counties, gives soundings, and is apparently the largest and best map published.

This sketch of Australian discoveries in the course of the past year would be imperfect if I were to pass unnoticed the perspicuous and popular explanation which, at two meetings of the Society, was given of this continent by Professor Jukes, derived from his own personal experience and long meditation. He clearly pointed out the source of that general character of drought which we know, from our seventy years' experience of it, belongs to the Australian land, and he indicated the causes which in particular localities tended to mitigate it. From the Professor's account we shall probably be led to the conclusion that the common belief that the great mass of the interior of the continent is but an arid desert, is well founded.

But even allowing such to be the case, still a vast amount of land remains for human use, and by good fortune it has so happened that we have hit at once on the best parts of the country. To judge by our experience of it, Australia may, as it appears to me, be described as a country of great drought, but at the same time, and probably arising from this very drought, a country of eminent salubrity, far exceeding in this respect every other colony founded by the nations of Europe. Not only does the European thrive in



a country not made for him, but to judge by the experience of three generations, he continues to thrive without the smallest appearance of degeneracy.

Besides this it may be said, that not only does the European thrive in the soil and climate of Australia, but all the animals which he had domesticated in Europe equally do so. For one of these animals, the sheep, Australia is better fitted than any other colony ever founded by the European race, and this country, with the exception of its intertropical portion, may be designated as an eminently pastoral one. For strictly agricultural purposes it is obviously less suited, for while it exports wool it imports corn.

The mineral wealth of Australia is remarkable, although as yet its development has but commenced. Independent of its iron and coal, it produces gold, silver, copper, tin, and lead ores, which are extensively imported into England.

Under the shield of the parent country, and in the enjoyment of the liberty which we ourselves possess, the Australian Colonies have made a progress of which there is hardly an example. Five small colonies, which ten years ago had between them a population not exceeding 400,000, contain now more than a million of people. They furnish us every year, and have been doing so for the last seven years, with 10,000,000*l.* worth of gold, with above 10,000 tons of copper, tin, and lead ore, and to the value of near four millions and a half of wool and tallow, while of British merchandise they consume above eleven millions and a half's worth, or at the average rate of 1*l.* 10*s.* for every colonist,—incontestable evidence of their value to us, as well as of their own prosperity.

#### EUROPE.

*Russia.*—After mentioning the labours of our own countrymen in various directions, I could scarcely speak of any more interesting than those of Russia. Her fields of research are so vast as to be almost inexhaustible; and year by year she solves the mysteries of some remote *terra incognita*, and accelerates the progress of geographical science. A successful war places at her disposal the treasures of the Caucasus, while, under the auspices of peace, her merchants and men of science carry the influence and civilization of their country to the confines of China and the base of the Himálayas, across a region of historic and scientific interest.

To the recent researches of Russian geographers we are indebted

for our present knowledge of one of the finest rivers of the world—the Amúr, which M.M. Peschurof, Permikin, Raddé, and other pioneers have so minutely described. Their narratives, translated for us by Mr. T. Michell, appear in an English garb in our Transactions for 1859, accompanied by an excellent map by Mr. Arrowsmith. With these, our knowledge of the Amúr is pretty complete; but much interesting matter will yet be furnished by the exploration still pursued, and by translations from other Russian accounts. Mr. Maak's work on the Amúr, alluded to by my predecessor in this chair at our last annual meeting, has been published at St. Petersburg, together with a map by M. Samokhvalof.

But I would more particularly draw your attention to Central Asia, as a country of permanent interest to every lover of geographical science. Since the days of Czomo de Koroos, the celebrated Majar, of our lamented Moorcroft and Trebeck, and of Wolf and Atkinson, much light has been thrown by Russian travellers on the Steppes of Turkestan.

The most recent scientific traveller in Central Asia is Captain Golubéf, of the Imperial Staff, who in 1859 explored the western part of the country between the Tian-shan and Alataú chains and the low valley of Lake Balkhash. That tract of country embraces the Semirechni (Seven Rivers) and Trans-ilian districts of the Russian Empire, and the provinces of Ili and Tarbagatai, appertaining to China; and while it is one of the regions of Central Asia least known to geographers, it is also one of the most interesting, forming, as it does, the boundary between the elevated plateaux of Asia and the Steppes, which extend from the Caspian to the lake of Balkhash.

The farthest point beyond the Russian frontier determined by Captain Golubéf, was the Buddhist Monastery of Sumbé, which no European traveller had yet visited. The hypsometrical observations made by this gentleman are of the highest value. He has, for instance, ascertained that the extensive lake of Issyk-kul, the most central point of Asia, situated between the Tian-Shan and Trans-ilian Alataú ranges, has an absolute elevation of about 5000 feet; while Fort Vernoé, a modern Russian fortification, about 55 miles to the northward, lies 2700 feet below the level of the lake.

A memoir on the Russian trade with Central Asia was read at the last meeting of the British Association for the Advancement of Science by our associate, Mr. Michell, whose intimacy with the Russian language has enabled him to consult the most recent

and authentic data in connection with the subject. He introduced to our notice a valuable work on Central Asia by M. P. Nebolsin, a Fellow of the Imperial Geographical Society of Russia, from which Mr. Michell has drawn many particulars relative to the social condition and requirements of the country east of the Caspian. It appears that between 1849 and 1857, the exports of Russia to Bukhára, Khiva, and Kokán had increased 78 per cent., and the imports from those countries 104 per cent.

The Khorassan Expedition, under M. Khanikof, has returned to Russia with much valuable information. M. Lentz and other members of the expedition have communicated to the Imperial Geographical Society the outlines of their labours in Persia and Afghanistan, but the general result of their explorations has not yet been laid before the public.

As M. Khanikof is shortly to appear among us, I have no wish to anticipate the valuable report which he probably will furnish. I may, however, say generally, that his researches are supposed to have been of the greatest importance to science. With regard to geography, in particular, our maps of Persia are threatened with considerable alterations, the expedition having frequently proved their incorrectness. Many towns depicted on modern maps have no existence, and the town of Tebbès—to mention one instance out of many—will have to be removed a degree and a half to the westward and a degree to the southward. According to the 'Compte Rendu' for 1859, no less than 100 points were determined astronomically by the expedition, and its explorations embraced 10 degrees of longitude and 13 of latitude.

The inquiry into the practicability of establishing a navigable water-way between the Caspian and Azof Seas has been revived. This project is of great antiquity, having been contemplated by Sultan Selim II., about the year 1570, and subsequently by Peter the Great, who, in 1697, caused works to be commenced with the object of establishing a communication between the Volga and the Don. These were, however, discontinued in 1701, and to this day the Don is the only great river in Russia unconnected with any other. Explorations were also made in 1831 and 1846 to ascertain the practicability of effecting the desired junction by means of the Kurá, but they appear to have revealed insurmountable obstacles.

Dr. Bergsträsser, of St. Petersburg, is now engaged in inquiring into the possibility of uniting the Caspian and Azof, by improving the water-way which now partially connects those seas. A very

extensive depression or valley, supposed to have been formed by the disjunction of the Black and Caspian Seas on the upheaval of the Caucasian chain, runs along the isthmus between the Azof and Caspian. Two distinct streams, severally called the Eastern and Western Manych, occur in this valley. Their water-parting is formed by the anticlinal axis of the country, at about 170 miles west of the Caspian, and which rises to an elevation of 107 feet above the Caspian and 23 feet above the Euxine.

The river Kaláns, coming down from the lower range of the Caucasus, disembogues a little to the west of this watershed into the Manych valley, and its waters principally flow off to the Eastern Manych, causing a very rapid current.

In spring, the Eastern and Western Manych are united at their sources by a shallow lake, called Shara-Hulusun; but this lake is not even navigable by boats. It is at this spot that Dr. Bergsträsser suggests the construction of an immense reservoir or lock. The Eastern Manych flows on within 47 miles of the Caspian, occasionally spreading out in shallow inundations and lakes; and in spring and autumn its waters find their way to the Caspian, in conjunction with those of the Kumà.\* It terminates in a lake which was once apparently connected with the Caspian, for a river-bed, in some parts filled with drifted sand, extends from it towards the sea, and the waters of the Caspian still ascend it for a certain distance on the prevalence of south-easterly winds. Dr. Bergsträsser considers that this river-bed might be cleared at a very small expense, and that, by removing the artificial obstructions by which a great portion of the Kumà and Manych waters is now deflected towards the pasturages of wandering tribes, and by collecting those waters within a single bed of no very great breadth, a navigable stream will be easily produced, available for steamers and vessels of war.

Before I quit this subject, let me express the regret with which we have heard of Mr. Lamansky's resignation of office as Secretary of the Imperial Geographical Society of Russia. The science we pursue, owes much to the indefatigable exertions of that gentleman, and is especially indebted to him for much valuable assistance and co-operation. Mr. Theodore Thörner has been elected in his stead, and will doubtless prove a very worthy successor.

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\* The western Manych was navigated in 1859 by a boat-party from its water-parting to the Sea of Azof. An account of this voyage is given in a Memoir by Dr. Bergsträsser, who urges a further scientific survey of the Manych valley. See 'Morskoï Sbornik' for October, 1859.

Nor should I omit the geographical and statistical descriptions of Russia recently published in the new-edition of the 'Encyclopædia Britannica.' I have the greater pleasure in drawing your attention to this article, since it is the production of our countryman—Professor Bishop of St. Petersburg.

*Sweden and Norway.*—The Expedition to the Polar Seas, proposed by the Swedish Government, has already been mentioned, but we have had to acknowledge with thanks the receipt of the useful maps and charts of Sweden and Norway, which continue to be regularly sent to us from those countries. Among the latest of these may be noticed the map of the province of Göthaborg in two sheets, scale about three miles to an inch, and executed in the same clear style as the previously published maps of the provinces of Carlskrona, Skaraborg, &c.

*Denmark.*—Captain Rhode, the Hydrographer of Denmark, has published an excellent chart of the north part of the Cattegat, of which the southern part will also soon appear.

The Royal Society of Northern Antiquaries of Denmark, under the able guidance of its Secretary, our learned Associate, Professor C. C. Rafn, continues the publications of its useful historical Annals and Memoirs.

From our Corresponding member, Captain C. Irminger, of the Royal Danish Navy, we learn with pleasure that Carl Petersen, the steady and trustworthy companion of Penny, Kane, Hayes, and McClintock, who had last year received from his Sovereign, the King of Denmark, the silver cross of Dannebrog, for his services in Greenland and the Arctic Regions, has since been gratified by the appointment of Inspector to the Light-house on the Island of "Hjelm" in the Cattegat, about 3 miles from the east coast of Jutland.

*Germany.*—A map of Frankfort, in 16 sheets, is engraved on the scale of  $1\frac{1}{3250}$  or about 4 feet to the mile, by A. Ravenstein, and deservedly ranks with any of the continental-city monographs.

Four elaborately tinted maps of the late Major A. Papen's Atlas of Central Europe, by A. Ravenstein, have been added to the five previously published, and the remaining three may be shortly expected.

*Prussia.*—Of the topographical map of Prussia, 10 sheets have been published this year, including portions of Thuringia. The Prussian Admiralty have published a chart of the estuaries of the Jade, Weser, and Elbe, in 6 sheets,

*Austria.*—A map of Dalmatia is near completion, as also one of Hungary and Galicia.

*Turkey.*—A map in 6 sheets, scale  $\frac{1}{288,000}$ , of Wallachia, is at present being engraved at the Military Geographical Institute of Vienna: it is a reduction of the survey made by the Austrian officers in 1856-7.

From Major J. Stokes, R.E., we have received an important paper, accompanied by a map, on which is marked with great precision the present state of the mouths of the Danube, with off-shore soundings. The writer compares this map with others of earlier date, and clearly shows how the various delta has been formed; how some passages have been silted up, and the deep-water channels opened out in other directions; that the débris of the soil, brought down the river at different periods from the interior, is first deposited on the coast, shoaling thus the water around the various mouths, until, by the accumulation of strata upon strata, it appears above water, through which the river forces its way, forming islands with tortuous channels, and the whole coast-line is gradually carried seaward.

*Holland.*—Six sheets have this year been added to the large map of Holland, on the scale  $\frac{1}{288,000}$  or  $1\frac{1}{6}$  inch to the mile, making 24 sheets published out of 62, of which the map will consist when complete.\*

*Belgium.*—Since our last anniversary, several excellent maps have been received from Belgium, especially those by our associate, M. Vander Maelen; of which the principal are, the provinces of Brabant, Hainault, Liège, Luxemburg, and Namur: all of these maps are on the scale of  $1\frac{1}{2}$  inch to a mile, and are well adapted for the use of travellers, as they exhibit the various railways, roads, and water communications.

*France.*—During the past year the hydrographic surveyors, under the late eminent engineer, M. Vincendon Dumoulin, have been employed on the coasts of Spain, Sardinia, and the west coast of Italy, and several sheets of these surveys have been published by the Dépôt de la Marine.

Of Spain, the south-west coast has been completed; of Sardinia, two sheets of the coast between Nice and Genoa have been published, which completes the survey of the coast of Liguria, under the direction of M. Daroudeans, who has also surveyed and published a beautiful chart of the Lipari Isles.

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\* See also page 135.

Of the west coast of Italy, the survey has reached the Bay of Salerno; charts have been published as far as the mouth of the Tiber: several sheets are far advanced in the hands of the engravers, which will appear in the course of the present year, and will include the Ponza Islands and the Straits of Messina.

The coast extending from near Amalfi, in the Bay of Salerno, to Monteleone in Calabria, has not been examined. For other accounts of the proceedings of French geographers I must refer you to the very full statement contained in the excellent report of our sister Institution, the Geographical Society of Paris.

We have also received 56 charts published by the Dépôt de la Marine, which have been incorporated in that valuable series.

*Sardinia.*—Three sheets of the large map of Sardinia have been added to our collections during the past year, making 78 sheets already published out of 91, of which the map is to consist.

*Switzerland.*—The Great Federal Map, as we are informed by our learned associate, Professor Paul Chaix, of Geneva, commenced about the close of the last century (1791) by Trelles of Berne, is nearly complete.\* It is engraved on 25 sheets; the scale is  $\frac{1}{100,000}$ , or  $1\frac{1}{2}$  inch to a mile.

Teer, the astronomer of Zürich, assisted by M. Sistalozzi and Professor Trechsel, conducted the survey to the year 1811, measured two base-lines and carried the triangulation over the cantons of Zürich, St. Gall, Appenzell, Thurgau, and the southern cantons.

In 1822 General Finsler surveyed the districts of Sargans (St. Gall), and conducted the survey until 1832, when it was considered necessary to connect the Swiss triangles with those of other countries, and especially with the Austrian survey.

In 1833 General Dufour succeeded M. Wurstenberger, and held a conference, at which it was determined that the map should be engraved on 25 sheets, each sheet 70 centimetres long and 48 broad, on a scale of  $\frac{1}{100,000}$  of nature, corresponding to an area of 70,000 metres by 48,000 metres.

The Government of Lucerne has decided on engraving that canton, on a scale of  $\frac{1}{25,000}$  or about 2·8 inches to a mile. The Canton of Glarus will be issued in about a year on a scale of  $\frac{1}{25,000}$ , but I regret to be informed that the Canton of Schaffhausen is not to be published as part of the Federal Map.

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\* The only sheet wanting (1860) is No. 13, and small portions of Nos. 8, 22, 23.

Among new maps are a geological map of Aargaurian Tura, by Casimle Mösch, scale  $1\frac{1}{2}$  inch to a mile; and a geological map of the eastern part of the Grisons, by Professor Theobald, scale  $\frac{7}{10}$  of an inch to a mile.

Professor O. Heer has published his "*Flora Tertiaria Helvetiæ*," in three vols., which our Associate, Professor J. M. Ziegler, has presented to the Society.

M. Studer has given some very interesting observations at Berne and its environs.

#### RECENT PUBLICATIONS.

*Atlases.*—The Royal Illustrated Atlas, by Messrs. Fullarton and Co., has reached its 20th part, and continues to merit the approval already bestowed upon it. The geographical notice attached to this Atlas renders it of value to the scholar.

Blackie and Son's Imperial Atlas is finished, and the parts containing the maps are published. The alphabetical index, containing 120,000 names, is now complete, and also exhibits great care and attention to detail in its valuable list of geographical positions.

The Royal Atlas, by A. K. Johnston, so well described by my predecessor in his Address of last year, steadily progresses. The 5th part, making in all 25 maps beautifully engraved, with an alphabetical index to each sheet, has been published, and comprises about half the atlas, which will be completed early in 1861. The hydrographical portion of each map being printed in blue ink, a single glance enables us to form an estimate of the relative proportion of land and water, in which particular it is in advance of its contemporaries. A new edition of the Geographical Dictionary and of the School General Atlas will be issued shortly. Of the series of large wall maps, noticed in the President's Address of 1858, Europe and Australia are published by Mr. Stanford; and Asia, Africa, North and South America, are constructed and in progress, Asia and North America being well advanced.

The distribution of maps, by a paper of so large a circulation as the 'Dispatch,' must tend materially to popularize geography. The maps, chiefly the production of some of our own members, are before us, and you will see that they form as comprehensive and cheap an Atlas as was ever produced.

*Ceylon.*—Since our last anniversary, Sir Emerson Tennent's elaborate work on Ceylon, published by Messrs. Longman, has appeared. The author has carefully examined into the physical geography,



the geology, the vegetable productions, the mineralogy, the zoology, and the natural history of the island, and to almost all these branches of science something new is added. The narrative, moreover, exhibits the state of Ceylon from the earliest antiquity. The work is illustrated by numerous maps, plans, charts, and drawings, and contains ample details of the form of government in the island, its revenues and expenditure, together with the principal sources of trade, especially the cultivation and export of *cinnamon*, and the more recent and eminently successful experiment of planting *coffee* on a grand scale.

*New Zealand*.\*—Dr. Thompson is already known to us by his memoir on the “stature, bodily weight, &c., of the New Zealand race of men,” read before this Society in 1852, and his present work is the result of an extended acquaintance with the regions in question. It is divided into three parts: the *first* gives a résumé of the physical features of the country and of the native inhabitants,—their laws, religion, warlike and other customs, their food and husbandry, their literature and domestic life; the *second* traces the various stages of European interference down to the present time; the *third* discusses the questions of their decrease and of the prospect of their future continuance.

*Sources of the Nile*.—Our Medallist Dr. Beke has resumed his pen and given us a volume, entitled “The Sources of the Nile, being a General Survey of the Basin of that River and of its Head-Streams, with the History of Nilotic Discovery,” illustrated by a series of maps. Thirteen years have elapsed since we published two papers by Dr. Beke “On the Nile and its Tributaries.” The whole has, however, been remodelled, and many important particulars are now published for the first time, by Mr. Madden.

*China and Japan*.—The “Narrative of the Earl of Elgin’s Mission to China and Japan in the years 1857-58-59,” by our associate, Laurence Oliphant, has been published since the last Anniversary, by Messrs. Blackwood. Mr. Oliphant furnishes us also with a concise account of his excursion to the Malay Peninsula, to which he was transferred in Malay sampans and hospitably received, and of his visit to the Philippine Islands. The first volume contains a lively and clear description of the various parts of China visited by the mission, with an account of the trade, manufactures, &c., of the people, and particularly of the ascent of the Yang-tse-Kiang

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\* “The Story of New Zealand, Past and Present, Savage and Civilized.” By A. S. Thompson, M.D. 2 vols. Published by Mr. J. Murray.

in H.M.S. *Furious*, commanded by Captain Sherard Osborn, R.N., F.R.G.S., an account of which will appear in the 30th volume of our Journal. The second volume treats of Japan and of the country and inhabitants generally, and abounds with interesting information with regard to that little known empire.

*Siberia*.—I have just been informed that our associate, Mr. Atkinson, so well known for his extensive travels in Russia, is shortly to publish a second work on Siberia.

*Eastern Africa*.—Consul M'Leod's "Eastern Africa, with the Narrative of a Residence at Mozambique," in 2 vols. Messrs. Hurst and Blackett.

Slowly but increasingly of late years the attention of Europeans has been drawn to the immense resources of Eastern Africa and the importance of redeeming that prolific region and its swarming inhabitants from the curse under which they are laid by the slave-trade. The Portuguese claim possession of the coast from the town of Lourenço Marques on the northern side of Delagoa Bay, to Cape Delgado. Within this range of 15° of latitude lie the mouths of the Zambesi where Dr. Livingstone is now pursuing his heroic enterprise, and southward, just within the Portuguese limits, the mouth of the navigable river Mouakuse, supposed to be continuous with the Limpopo, which forms the northern limit of the Transvaal Republic. Between the two rivers lie the Sofala river, town and territory which Mr. M'Leod identifies with the Ophir of Scripture.

This work, besides giving a statement of the Portuguese settlements in East Africa, supplies valuable information relative to the African dominions of the Imám of Muskat, the island of Madagascar, and the other islands of the Ethiopian Archipelago. The last portion of the work enters fully into the commercial resources of Eastern Africa.

The Travels, Researches, and Missionary Labours of the Rev. L. Krapf have been published by MM. Trübner and Co., and include also the journeys of the Rev. J. Rebmann and the Views on the Resources of the Wanika, by the Rev. J. Erhardt. To these is prefixed an account, by Mr. E. J. Ravenstein, F.R.G.S., of Geographical Discovery in Eastern Africa.

*Manual of Geography*.—The best testimony to the merits of Mr. W. Hughes's Manual of Geography is supplied by the fact of the numerous editions which have been successively called for within a recent period. The leading idea which its author has sought to embody in this volume, is the connection of physical geography with the indus-

trial pursuits and social condition of nations, or, in other words, the *geography* of industry and commerce, viewed as dependent upon the natural features, climate, and productions of the various regions of the earth.

*Encyclopædia Britannica*.—The *Eighth Edition* of this great work is in course of publication by Messrs. Adam and Charles Black of Edinburgh, and is nearly completed. It will comprise twenty-two quarto volumes, illustrated by upwards of five thousand engravings on wood and steel. The articles have been carefully revised and carried up to date, and a reference to the list of the principal contributors is sufficient to stamp the value of the work.

*New Granada, Equador, Peru, Chile, etc.*, by Mr. Wm. Bollaert, F.R.G.S.—This work, dedicated to Sir Roderick I. Murchison, will shortly appear. The author is already known to us by his papers published in our Transactions.

*Ruins of Carthage*.—Mr. Davis has been engaged since 1856 in excavating the ruins of ancient Carthage and Utica, and the objects of antiquity he has discovered are now being arranged in the British Museum. At the close of his excavations he visited the sites of other ancient cities.

*Map-Projections, etc.*—We have received two map-projections, one by Sir John Herschel, the other by Col. Sir H. James. Also an interesting paper on a method of observing the lunar distance, by Col. G. Everest. These will be printed in our Journal.

*Great-Circle Sailing*.—Two mechanical methods of solving problems in great-circle sailing have been published. One by Captain W. C. Bergen, of the mercantile marine, is by charts of the gnomonic projection. This method is considered by Mr. J. W. Share, R.N., to be the most satisfactory, expeditious, and accurate of all the mechanical methods that have been hitherto devised. A *straight line* ruled across any part of these charts represents the arc of a great circle.—The other by Capt. Berger, also of the mercantile marine, is termed the "Patent Sphereometer," invented for the purpose of obviating all abstruse calculations in great-circle sailing. It consists of a hollow hemisphere of wood, coated over with a slaty composition, on which are marked only the parallels and meridians: a graduated, moveable brass meridian serves to measure the distance between the two places. The various courses are ascertained by a brass protractor, fitted to the sphere.

*Star Maps*.—A new edition of the six maps of the stars on the gnomonic projection, designed and constructed by Sir J. W. Lub-

book, and published in 1844, under the superintendence of the Society for the Diffusion of Useful Knowledge. This new series is edited by Mr. Charles O. Dayman, A.M., and contains all the objects in Vice-Admiral Smyth's cycle.

An atlas will shortly be published, containing four maps of the stars and two maps of the world, on Sir Henry James's geometrical projection of two-thirds of the sphere; with a table, for the construction of maps on this projection, on any scale that may be required. The celestial maps on this projection possess the peculiar advantage of presenting at one view the two poles and all the circumpolar stars within  $47^{\circ}$  of one pole, and all those within  $125^{\circ}$  of the central meridian,

Finally, it affords me great pleasure to notice the successful progress of this Society during the past years, which has been the subject of comment in the several Council Reports submitted to the Fellows at the Anniversary meetings, and may be seen at once by comparing the income, which amounted, ten years ago, to only 778*l.*, while in 1859 it reached 3471*l.* During the above period, 3000*l.* has been expended on the Library and Map-Rooms, and furniture and fittings, besides which a sum of 2500*l.* has been added to the Permanent Fund.

The result of these ten years may be thus briefly stated:—The collections in the Library and Map-Rooms have more than *doubled*, the number of Fellows has more than *trebled*, and the income has increased *five-fold*. In 1849 the revenue admitted of an outlay of less than 100*l.* on publications; in 1859 it warranted an expenditure of little short of 1000*l.*

Sincerely do I congratulate you on this state of your affairs. The progress of the Society of late years has been rapid, but at the same time steady and continuous. Our increasing numbers, the large attendance at our meetings, the character of the communications which we receive,—all tend to prove that the labours of the Society are widely recognised and appreciated. And, as it seems to me, it ought to be so; for I know no country in the world to which the results of geographical investigation are calculated to be of greater value than they are to England. With an empire that extends to every quarter of the globe, and embraces within its rule almost every variety of the human race, and with a commerce that fills every sea and occupies every port, the English have, perhaps,

more to gain from the prosecution of geographical science than any other nation; and the researches of geographers are no less important to our statesmen and our merchants, than to our men of science themselves. I feel, therefore, no doubt that our recent prosperity will still be continued and extended, if we bear in mind that, while the spread of science is our first object, it is also our duty to render the knowledge we acquire and store up as available as possible for the general information of our countrymen. I believe that our readiness to do this has added much to the popularity, as I am confident that it has greatly increased the usefulness of the Royal Geographical Society.

Now, gentlemen, it only remains for me in concluding this Address to resign into your hands the honourable post to which you were pleased to call me a year ago. The usual custom would, I believe, under ordinary circumstances have justified me in hoping to be permitted to occupy this chair for another year. But I thought it right some time ago to intimate to the Council that I should feel it my duty to resign the office of President at the termination of the first year. When I was elected last May I had every reason to believe that I should be able to devote ample time to the discharge of the duties of your President, and at least to do my best to serve the Society in the high position in which they had placed me. But, as I am only too keenly conscious, this has not been the case. Having been called very shortly after my election to fill a laborious and important office in the Government, it has been impossible for me to give that attention to the affairs of the Society, which it would otherwise have been a great pleasure to me to have afforded; and if the Society's interests have not suffered in consequence, it has been due only to the efforts of my colleagues on the Council, who I fear at much personal inconvenience have most considerately and efficiently supplied my place. Under these circumstances I could not hesitate a moment as to the course which I ought to take. I was aware last year when I entered upon this office how little fit I was to fill it; I knew that I owed the honour of your choice far more to your grateful recollection of your first President than to any personal qualification of my own; but I hoped to be able to prove my gratitude to you by a zealous devotion to the interests and business of the Society. When that became impossible to me, my own inclination would have prompted me to have tendered you my resignation at once; but, as I understood that such a course would not be convenient to the Society, I have

waited until the return of the usual period of election has enabled me to retire from my office without disturbance to our ordinary arrangements. I shall, gentlemen, ever feel sincerely grateful to you for the forbearance with which you endured my shortcomings, and for the kindness which you have ever shown me. To the members of the Council my warmest thanks are due for the never-failing readiness with which they have taken upon themselves the various duties which I have been compelled to neglect. The same friendship which led Sir R. I. Murchison to support my election as his successor last year, has induced him to act for me on numerous occasions with a kindliness which I shall never forget, and which has enabled me to feel that my forced absence from many of your meetings, however disagreeable to myself, has often been in reality a gain to you by placing him in the chair. Let me also here avail myself of the opportunity of returning my best thanks to Dr. Norton Shaw, for the zealous and able assistance which he has always afforded me.

Gentlemen, it is a great satisfaction to me to know that I shall be followed in this chair by one so well able to discharge all its duties, as my friend Lord Ashburton. His varied knowledge, his love of science, and his eminent personal qualities render him admirably fitted for the post to which he has been elected; and in resigning to him the office which I have so inadequately filled, it is to me a source of much gratification to feel assured that the interests of this Society are about to be entrusted to one who is so well qualified to promote that, which must ever be of high importance to me,—the prosperity of the Royal Geographical Society of London.

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